OCTOBER 18, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

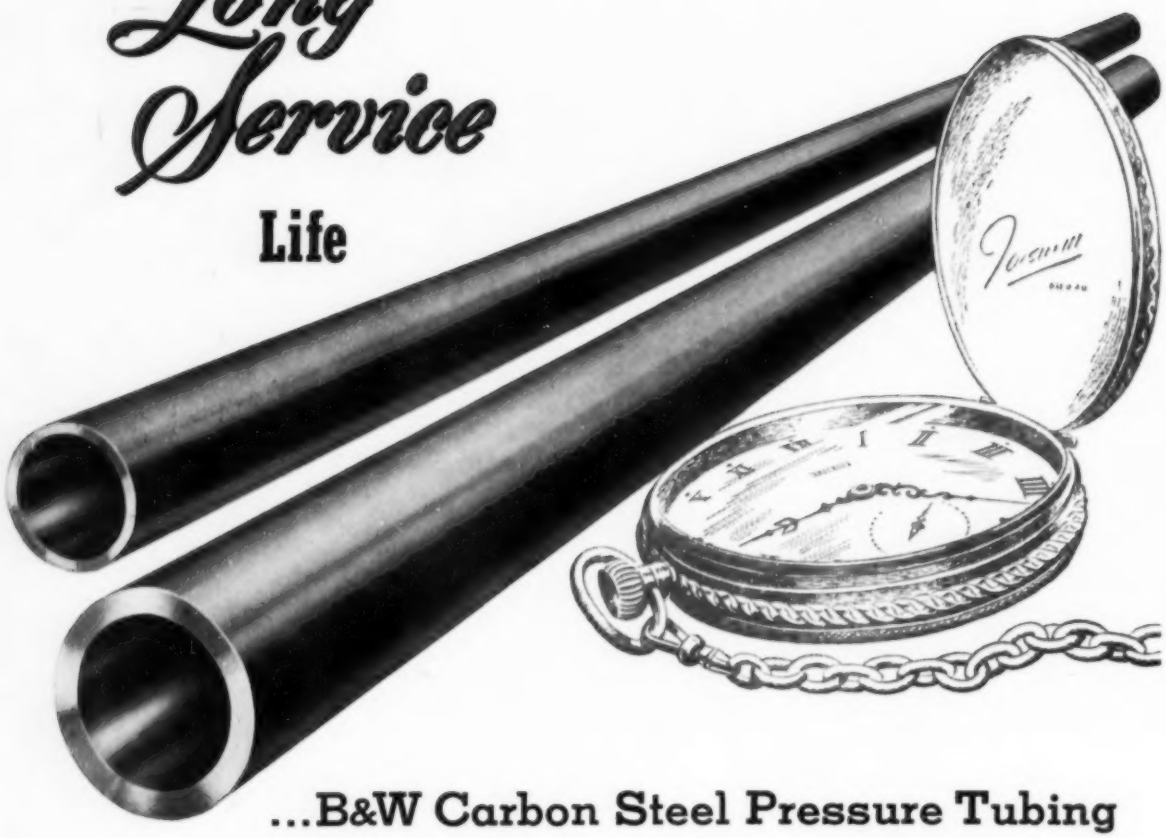
Blue Chip Benefits

Fringe benefits count in higher brackets, too, p. 52

✔ **Barrel Finishing—Tumbled Parts Take On a Cost Edge, p. 184**

CONTENTS—PAGE 5

For *Long Service* Life



...B&W Carbon Steel Pressure Tubing

The collection of qualities found in B&W Carbon Steel Pressure Tubing, Seamless or Welded, adds up to the all-important end result of long service life.

No less important are the "pre-operating" qualities like uniform ductility, accuracy of dimension and ease of fabrication and installation. Each is a plus that contributes to overall *working* satisfaction from beginning to end use.

Specifically, B&W Carbon Steel Seamless Tubing is available in sizes up to 9⅝ inches outside diameter and B&W Welded is available in sizes up to 4 inches outside diameter. Both in a wide range of wall thicknesses.

As for finishes, seamless is produced either hot-finished or cold-drawn and welded is produced from either hot- or cold-rolled strip.

It meets the applicable specifications of the ASTM, ASME and Government as well as many specifications that may be required for an extraordinary end use.

Where and whenever Seamless or Welded Carbon Pressure Tubing is indicated, make use of B&W's many years in the manufacture of all kinds of tubing. Make *use* of B&W Carbon Steel Pressure Tubing.

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

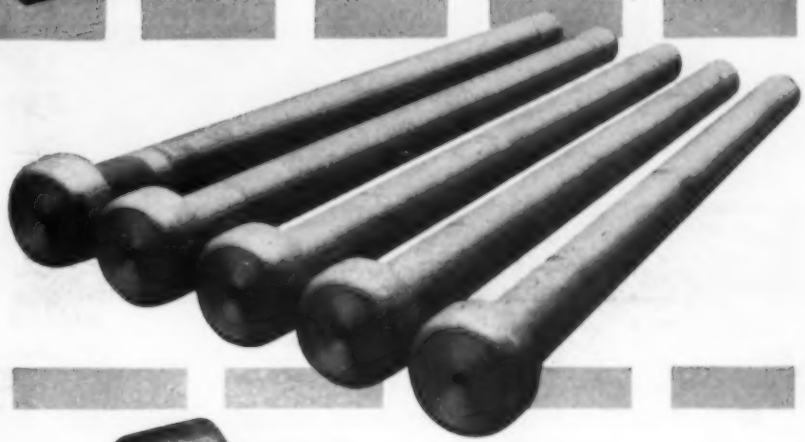
For the complete Carbon Steel Pressure story, write for B&W Bulletin TDC-142.

TA-4062(CP)

Big Forgings

Double-flanged shafts for use in hydroelectric installations. The one at the right weighs 67 tons; the one alongside it, 52 tons. Both were smooth-bored with 12-in.-diam axial holes.

. . . and some that aren't so big



Tie rods weighing 2¼ tons each. Length, 16 ft 10 in. The diameters of the flanges and main bodies are 16½ in. and 10 in. respectively.

. . . and some that are flyweights

One of the little fellows of the Bethlehem family—a drop forging that grosses less than 2 lb. Some we make are even smaller.

The Bethlehem forge shops are so highly diversified that a customer can get just about any forged product he wants.

We're always glad to furnish him massive giants weighing sixty, eighty, a hundred tons. Or considerably more than a hundred, if his needs run that high.

But if he requires some medium-sized pieces, or something very small, he'll find us equally well set up to do the job. And whenever he wants his forgings machined . . . all he has to do is give us the specifications.

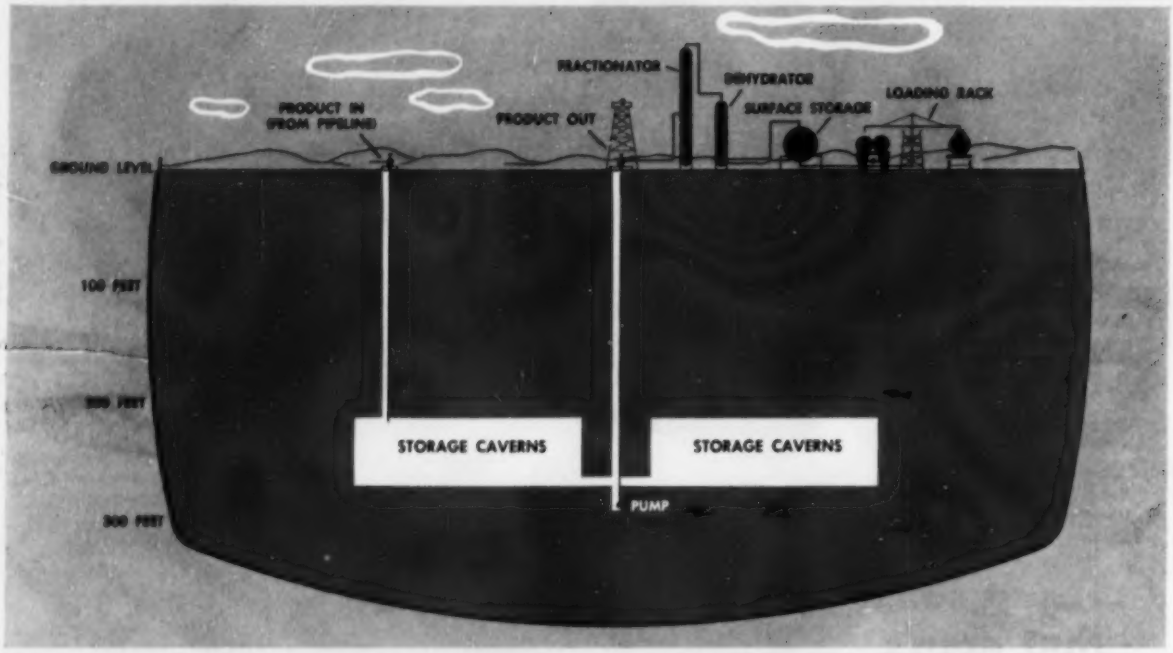
May we say it again? Bethlehem Steel Company makes *all* sizes of forgings. And pleasing the customer is a specialty of the house!

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

HUGE NEW UNDERGROUND STORAGE CAVERNS ASSURE A DEPENDABLE SUPPLY OF PHILGAS*



*Philgas** IS AMERICA'S LARGEST SELLING LP-GAS

● Strategically situated underground storage caves are used by Phillips Petroleum Company to assure you of a dependable, year-around supply of LP-Gas. The storage cavern, illustrated above, mined from shale below the pipeline terminal at Kankakee, Illinois, stores nearly 300,000 barrels of Philgas for Chicago and the Great Lakes market. Phillips also maintains its own fleet of tank cars and trucks to provide prompt deliveries. As a Philgas contract customer, you can depend on a plentiful supply of Philgas at all seasons of the year.

Philgas is a clean-burning LP-Gas with uniform thermal values and gravity. It is free from harmful contaminants. Use it for core baking, mold drying, heat treating, ceramic operations, food processing, textile finishing, metal cutting and space heating. Many companies are also using Philgas as a motor fuel because it burns clean and saves money on overhaul and fuel costs. Write for full information. Find out how Philgas can help in your business.

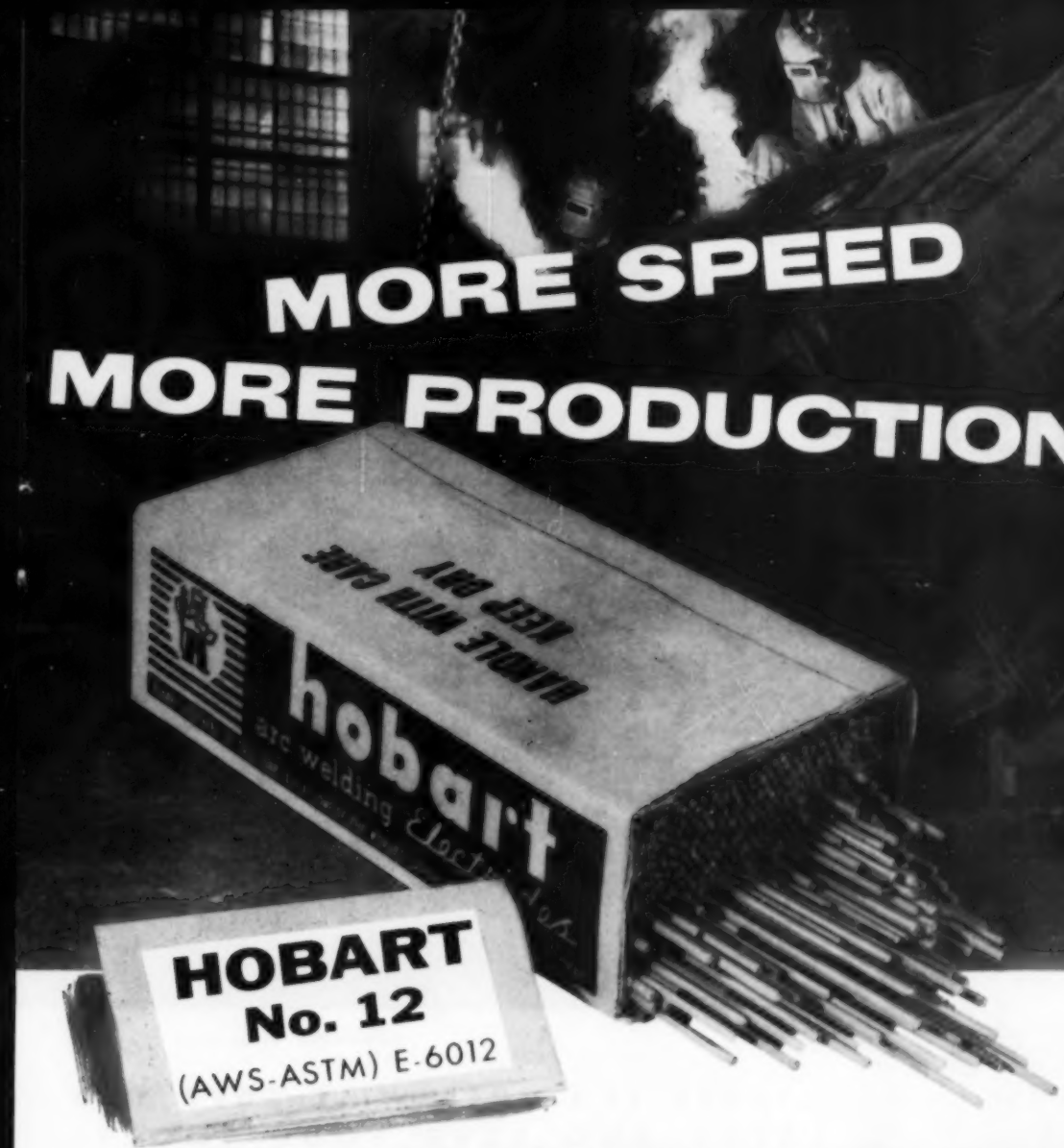
*Philgas is the Phillips Petroleum Company brand name for its high quality LP-Gas or bottled gas (propane, butane)

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

PHILLIPS PETROLEUM COMPANY

Sales Department · Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.



MORE SPEED
MORE PRODUCTION

HOBART
No. 12
(AWS-ASTM) E-6012

A few other **HOBART electrodes**

- HOBART **10** (AWS-ASTM) E-6010
- HOBART **335** (AWS-ASTM) E-6011
- HOBART **447** (AWS-ASTM) E-6013
- HOBART **13** (AWS-ASTM) E-6013
- HOBART **313** (AWS-ASTM) E-6013
- HOBART **885** (AWS-ASTM) E-7010
- HOBART **111-HT** (AWS-ASTM) E-7020
- HOBART **ROCKET 24** (AWS-ASTM) E-6024
- HOBART **16 & 716** (AWS-ASTM) E-7016
- HOBART **816** (AWS-ASTM) E-8016

MAKE AN ON-THE-JOB COMPARISON

...see why HOBART gives extra performance

For use in any position with DC or AC current, the Hobart No. 12 (E-6012) will handle 80% of your production or maintenance work. Many of the country's largest fabricators say the Hobart No. 12 costs less than any other E-6012 electrode. And here's why you'll agree once you try them. There's less spatter and stub loss . . . less cleanup time . . . more actual weld deposit . . . increased production. The Hobart No. 12 operates efficiently on very high welding currents—lets you increase your welding speeds. *Compare them in an on-the-job test.* Tell us the type of work you're doing and we'll send you test samples without obligation. *Write today to:*

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BOX ST-104, TROY, OHIO, PHONE 21223

HOBART *"One of the world's largest builders of arc welders and welding equipment."*

Laboratory and New Electrode Manufacturing Facilities Insure Continued Improvements

See a revolutionary welding advancement in Space 365, National Metal Congress and Exposition, Chicago, Illinois, Nov. 1-5, 1954

CONTINENTAL COUNTERBORES

INTERCHANGEABLE WITH A

Twist of the Wrist

Continental Counterbores may be purchased individually or in sets. Selection of three sets available. Write for new Counterbore Catalog.

THESE FEATURES WILL SAVE YOU TIME AND SAVE YOUR TOOLS:

Hand Detachable—one quarter turn by hand, ***a twist of the wrist*** engages or releases cutter.

Balanced Drive—*double* lugs on cutter engage *double* abutments in holder; *double* aligning bearings for rigidity.

Extra Torsional Rigidity—drive lugs are close to seating shoulder of cutter.

Practically Indestructible—driving forces apply compression, not shearing action.

Right or Left Hand—one quarter turn locks or releases either right- or left-hand cutters.

Outside of Holder Free from Obstructions—obtainable for piloting in bushing, fluted to remove chips or threaded for stop nuts or collars.

The Continental Drive is available in standard counterbores, spot facers, countersinks, and also on special tools such as multiple-diameter cutters, step counterbores, radius and chamfering applications. It is equally applicable for inverted operations. Order through your Ex-Cell-O representative or direct from Continental Tool Works in Detroit.

CTW

Other Continental Products: Standard and Special Cutting Tools, Broaches and Broach Fixtures.

CONTINENTAL TOOL WORKS
Division of Ex-Cell-O Corporation, Detroit 32, Michigan

54-28

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 16 October 18, 1954

√ NEWS √ PRODUCTION-ENGINEERING √ MARKETS

Metalworking Outlook 41

As the Editor Views the News 45

Trends In Executive Compensation 52
Knowing how to pay top executives is as important as how much to pay them

Windows of Washington 56

How To Put Efficiency Into Your Fleet 60
You probably are not getting the most out of your auto fleet. Here are some helpful tips

Mirrors of Motordom 63

The Business Trend 67

Men of Industry 71

Technical Outlook 91

How To Drill and Rivet Titanium 92
Tests have proved it can be drilled and riveted satisfactorily if correct tools and procedures are used

Induction Heat Treatment 94
Selectivity Teams Up With Versatility—No. 10 in STEEL's Modern Heat Treating Series

Progress in Steelmaking 100
Last Expansion Piece In Place—With construction completed at this plant, optimum production versatility results

Barrel Finishing Tumbles Part Costs 104
Process can be applied to a wider variety of metal parts than thought possible. Here's evidence

Armor Plant Joins the Reserves 114
"Mothballing" of a cast armor plant in East Chicago is an example of new approach to preparedness

New Products and Equipment 117

The Market Outlook 137
Metal Prices and Composites begin on Page 138.

Nonferrous Metals 140

Behind the Scenes	6	Foreign News	59
Letters to the Editors	10	Obituaries	77
Calendar of Meetings	27	Helpful Literature	131

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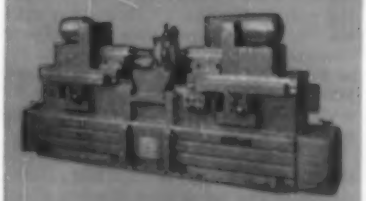
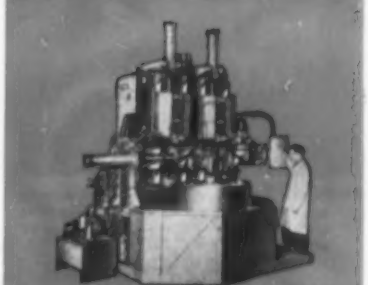
XLO
PRECISION BORING MACHINES
High production, cost-saving machines for fast, accurate boring, turning, facing, chamfering and grooving.

Standard Precision Boring Machines



Way-type Precision Boring Machines

Precision Cylinder Boring Machines



Vertical Precision Boring Machines

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

ONLY 1½ MINUTES to weld joint in 12" pipe fitting

Figure 1. Perfect X-Ray Results *on welding flanges and fittings. Welding gun is mounted on inexpensive fixture.*

HIGH quality welds are now produced with single pass welds using Manual Lincolnweld. (Figure 1) Welding speeds average 25 inches per minute. No joint preparation is necessary, because high density currents used (up to 600 amp on 5/64" electrodes) permit 100% butt welds on plates up to ¼" with single pass from each side. The welds pass X-Ray inspection.

Through faster, easier welding, substantial cost savings are realized on construction and maintenance work where the work can be welded in the flat or near flat position. A lightweight welding gun and flexible cable permit free, easy movement for manual operation. (Figure 2) The welding gun can also be mounted on simple, inexpensive fixtures to provide the benefits of automatic welding at low cost.

Manual Lincolnweld is versatile for hardsurfacing of worn parts. Hardsurfacing is done with mild steel electrodes and Lincoln Agglomerated Fluxes in which the alloy is introduced through the flux.

Figure 2. Free, easy movement *permits welder to guide welding gun for many types of down-hand operations for maintenance and fabrication work.*

HOW MANUAL LINCOLNWELD CUTS YOUR COST

Details in Bulletin 1303, available by writing.

THE LINCOLN ELECTRIC COMPANY

Dept. 1611, Cleveland 17, Ohio

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

behind the scenes

Revealing Figures

Is business getting better or worse? Should management count inventory and retrench, or should it pour a lot of money into new products? As a man thinketh, so he is, and much of the thinking mentioned above is reflected in private estimates of STEEL's November 8 Industrial Production Index figure. As you know, this widely quoted Index is based on and weighted by steel output, electric power output, freight car loadings and automobile assemblies. The figure varies: a few weeks ago it stood at 114.33, whereas a year ago it was 134 point something. Editors Bob Jaynes and Jim Morrissey guessed what it would be for the week of November 8; burning with gambling fever, they plunged to the extent of wagering a tin roof.

We invited our readers to get in on the bet, too, and the figures we have received range from a pessimistic 100.10 to a most optimistic 134.25. Every person who sends in a guess will receive a gay pen-and-ink reproduction of a gambler, printed in sepia on 6½ x 9½-inch stock. How about YOU? Is your guess in yet?

It's really very simple to figure, you know: begin by juggling steel output against freight car loadings, and subtract auto assemblies because you figure on driving the same old heap another year, and add electric power output because naturally the lights will be staying on longer, and where are you? Why, you're right up there among business-trend forecasters, with a figure you've arrived at in your own head . . . and by the way, let's have that figure before you forget it.

Love Those Slips

Before a line of type appears in the final print the possibilities of error are so great they are beyond count, if you take into account the progression of numbers and the multiplication of human propensities for committing boners. A string of words heading for the press goes through a net of editors, linotype operators, proof-readers, copy-readers, printers —and sometimes even the press-men. Mistakes of omission and commission are weeded out, and the most amazing thing to anyone who cares to think about it is the fact that so FEW errors appear in print.

A few weeks ago Al Baker, composing room foreman, glanced casually at the page containing "Behind the Scenes" a few moments before it was to be taken away and locked in the press. His honest face paled, and he leaped at the telephone like Bobby Avila diving at a hot grounder. He had seen our comment about tin, particularly the line that read ". . . when you bend a tin bar, it will cry," and the only difference between the text and final proof was the way "bar" appeared; it came out "bra".

Another Bust

Typographical errors are wonderful. Many persons collect them as a hobby. The mistakes are doubly funny when a retraction is made, and an error appears in the retraction. This one happened in Cleveland: the story concerned a policeman, and contained the following jewel: ". . . so-and-so, who was a defective on the police force." The maligned detective screamed like a wounded tapir, so the newspaper hurriedly printed a retraction—"We regret naming so-and-so a defective on the police force; what we really meant to say was that he was a detective on the police farce."

Ain't Leaves Wonderful?

Getting a back-ache raking leaves these days? And saying bad words about them? Then you must re-arrange your thoughts, brother, and show more respect for the foliage that buries your property. Our next-door neighbor is a real hot-shot botanist—a professor, if you please—and he chided us the other day on our attitude toward leaves.

Leaves are wonderful, he said. On the under, or earthward side of a given leaf, do you know what you would find if you examined the epidermis? You would find at least 60,000 stomata, each one breathing like crazy, because stomata are pores. Each stomatum is stuffed with chlorophyll, so no matter what a leaf eats, it can never suffer from halitosis.

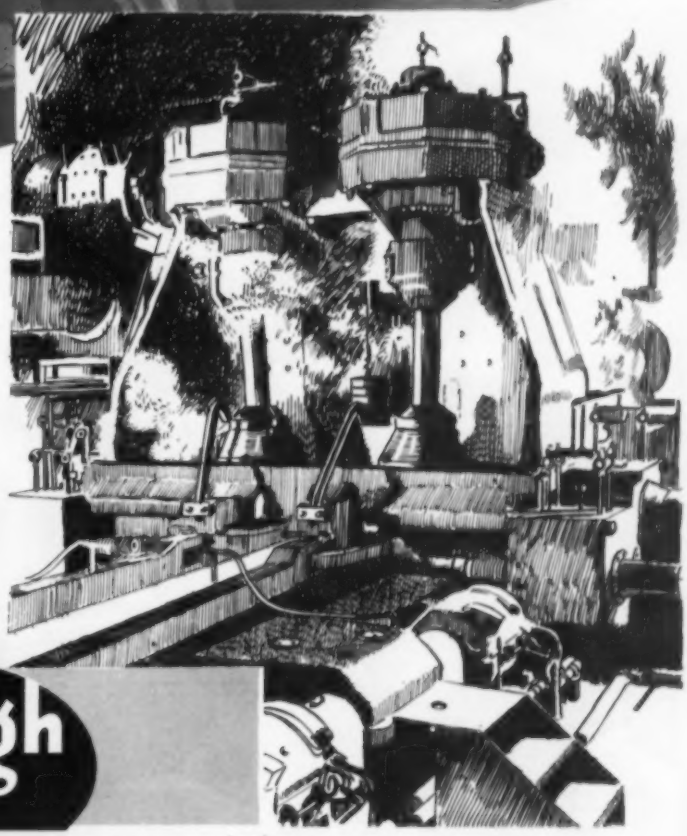
Shrdlu

(Metalworking Outlook — Page 41)

Cut Costs

with PITTSBURGH's made-to-order modern mill machinery

This evidence of design and construction proves our point. May we serve you?



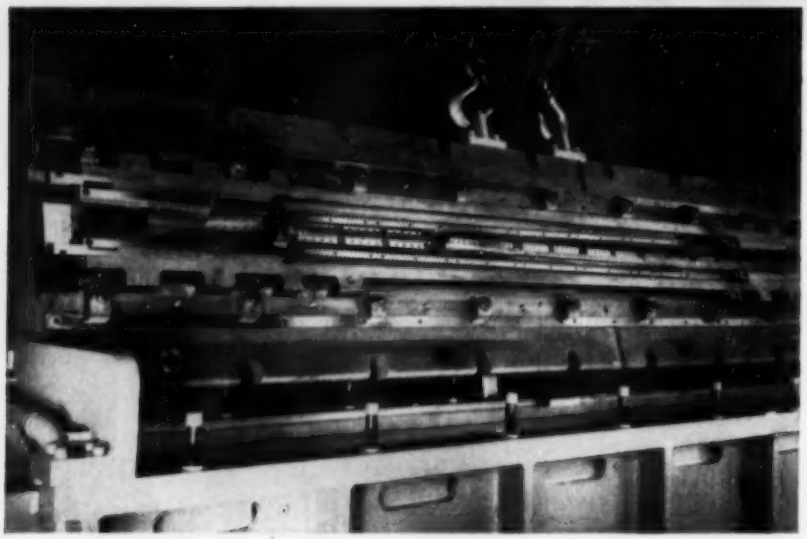
pittsburgh
ENGINEERING & MACHINE CO.

Mailing address: Box 986 Pittsburgh 30, Pa. • Plant at Glassport, Pa.

DIVISION OF PITTSBURGH STEEL FOUNDRY CORP.

Here's the exciting story about a **BROACHING MACHINE**

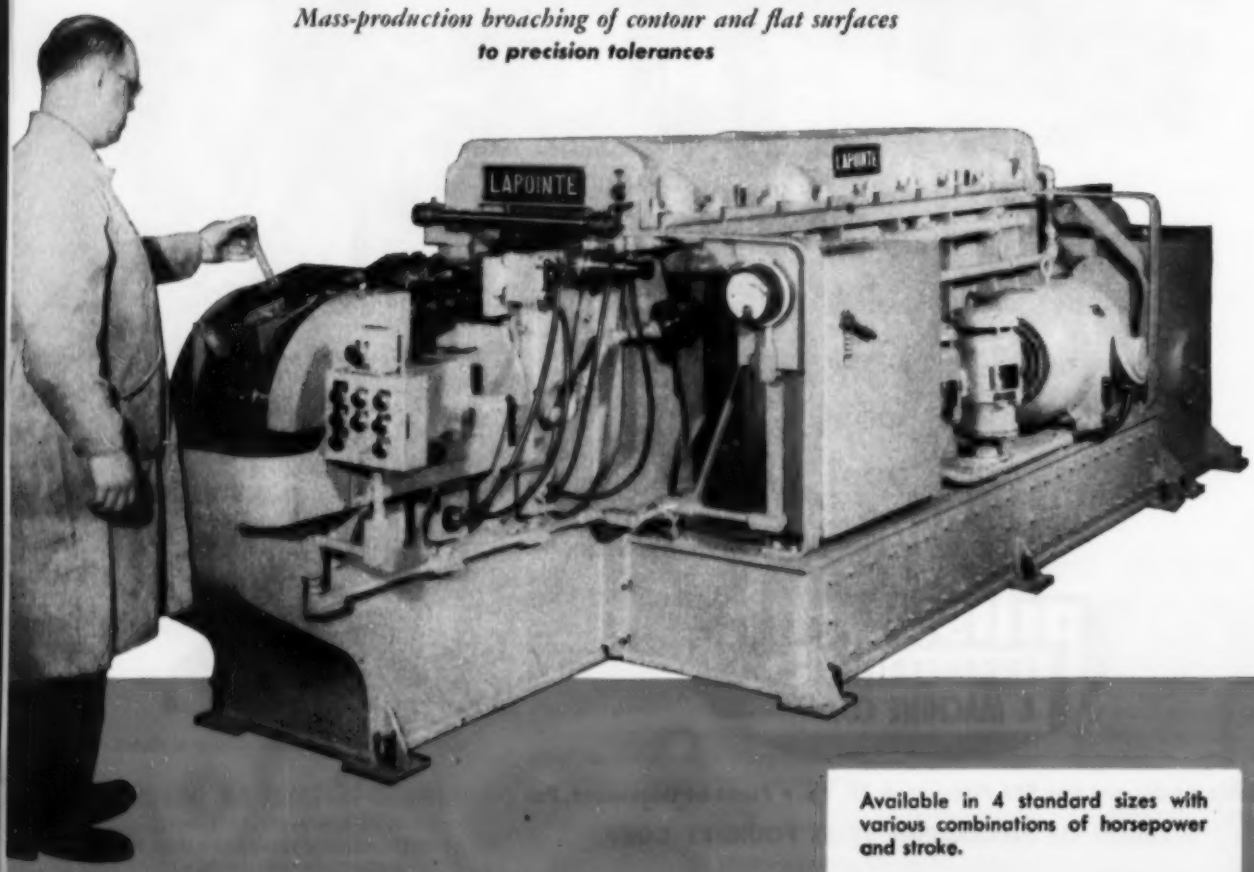
the LAPOINTE



THE BONNET,
or broach-carrying cover, is hinged to the frame and accommodates the main broach assemblies.

Observation Ports
enable the operator to see the condition of the broaches in action.

Mass-production broaching of contour and flat surfaces
to precision tolerances



Available in 4 standard sizes with various combinations of horsepower and stroke.

that DOESN'T STOP!

CONTINUOUS BROACHING MACHINE

RUNS ALL THE TIME

. . . you don't stop it to index
. . . you don't stop it to feed
. . . you don't stop it at all
(it's the nearest thing to perpetual motion!)

THE PARTS MOVE — NOT THE BROACH!

A powerful, matched-twin-chain drive is fitted with a series of individual fixtures (*designed by Lapointe*) that are completely automatic: self-operating, self-locating, self-clamping, and self-releasing. The operator merely drops the parts into the work nests.

FABULOUS PRODUCTION IS POSSIBLE

For instance, production of more than 1400 automotive connecting rods per hour has been maintained, broaching the sides, joint face, and half-round. 1400 . . . 1700 . . . 2000 parts per hour can be broached under full automation, with the optional hopper feed. What can this mean *for you*, on parts that you are *not now broaching*? Here is *precision* with *production*, and the great advantage of *machined surfaces!*

• • • •

Exceptionally heavy and rigid design assures smooth operation, long tool life, and excellent broaching finish. Completely fool-proof, the machine will stop automatically if parts are incorrectly positioned in manual loading.

FEATURES

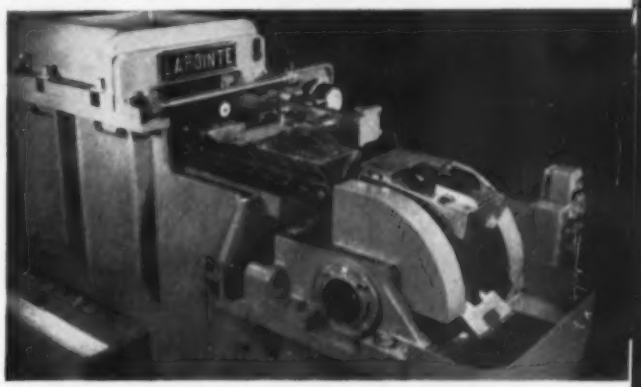
Engineered for ease of loading.

Broached part automatically releases at rear of machine onto suitable conveyor.

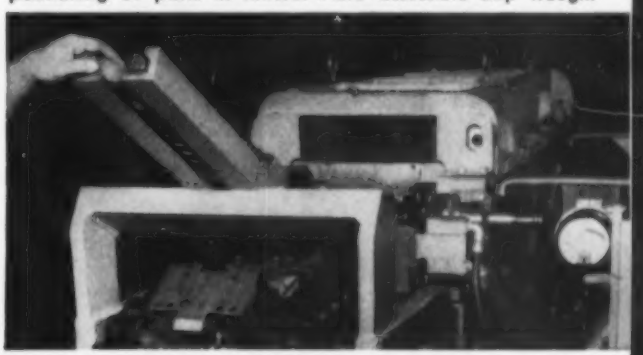
Multiple speeds. Changes in pick-off gears can easily and quickly be made.

Plus: Electric brake, for instant stopping; segmented sprocket, for simplified maintenance; two individual coolant pumps, for dependable flow; shear pin coupling, in convenient location.

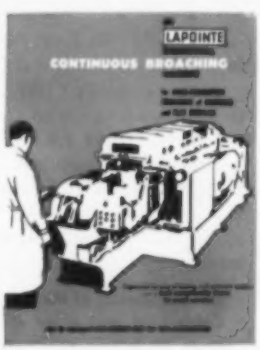
LAPOINTE does the whole job! We assume 100% responsibility because we build the machines, tools, and fixtures!



Front of machine, showing safety stop (the round white disc under Lapointe name-plate.) This safety stop assures positive positioning of parts in fixture. Note accessible chip trough.



Lends itself to **FULL AUTOMATION** when equipped with hopper feed.



Get precision results at reduced costs!

Every plant that is now mass-producing parts should investigate the Lapointe Continuous Broaching Machine with its many superior advantages. Send for descriptive bulletin CH-3.

THE LAPOINTE MACHINE TOOL COMPANY
HUDSON, MASSACHUSETTS • U. S. A.
In England: Watford, Hertfordshire

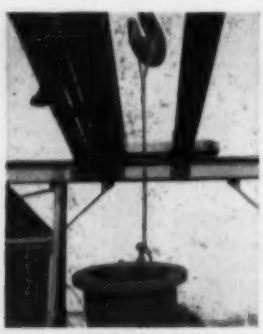
THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES

ACCO Registered* Slings

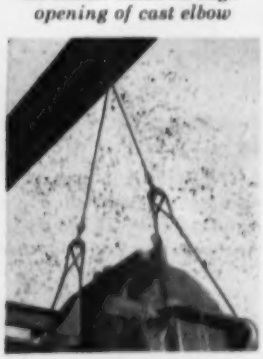
ACCO Quality

It's Flexible—and It's ALL Steel CABLE-LAID SW-56

Single leg used in basket hitch around heavy rough casting



Another leg used in choker hitch through opening of cast elbow



Two legs used as whip slings for heavy unbalanced load

"It's the most useful sling we have ever had"

• This is what users say because ACCO Cable-Laid has the flexibility of manila rope but the strength of steel. It's made from improved plow steel wire for greatest known strength. Yes, even the independent wire rope core is made of the same tough wire.

The high flexibility of ACCO Cable-Laid comes from the construction of the rope. It's not just six strands around the core, it's six separate wire ropes laid around the wire rope core. This is also what gives ACCO Cable-Laid its fine resistance to kinking even after used around square corners.

Add to ACCO Cable-Laid the patented DUALOC ending—and the ACCO half-thimble—and you have a sling which can't be beat for all-around usefulness and low cost lifting. In addition to the inherent advantages of the ACCO Cable-Laid construction, these slings are ACCO *Registered* with all of the advantages this specification assures.

Get full details of the SW-56 ACCO Registered Cable-Laid and other ACCO Registered Wire Rope Slings from your nearby ACCO Registered distributor—or write us at Wilkes-Barre, Pa.

**Trade Mark Registered*

ACCO

TRADE MARK

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AMERICAN CHAIN & CABLE

for Better Value

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn. • In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

LETTERS
TO THE EDITORS

What's Up in Furnace Trade

May we have permission to reprint your article, "Home Heating Equipment: The Hot and Cold of It" (Heating equipment makers have plenty of reason to rest on their oars; but, they aren't . . .), on p. 79 of the Sept. 20 issue?

We believe this to be an excellent analysis of the situation and would like to pass it on to our dealer and jobber customers if it's O.K. with you.

William A. Cook
Meyer Furnace Co.
Peoria, Illinois

• *O.K.—ED.*

Cutters Clip Along

On p. 115 of the Aug. 16 issue, there is an article, "Helical Carbide Cutters Step Up Milling," which refers to helical carbide cutters being made by Sonnet Tool & Mfg. Co. and marketed under the trade name of "Helicarb." We would like to get further information.

W. J. Baker
plant purchasing agent
Atlantic Division
American Can Co.
Geneva, N. Y.

• *Address of Sonnet Tool & Mfg. Co. is 580 N. Prairie Ave., Hawthorne, Calif.—ED.*

Shadow of Doubt on Test

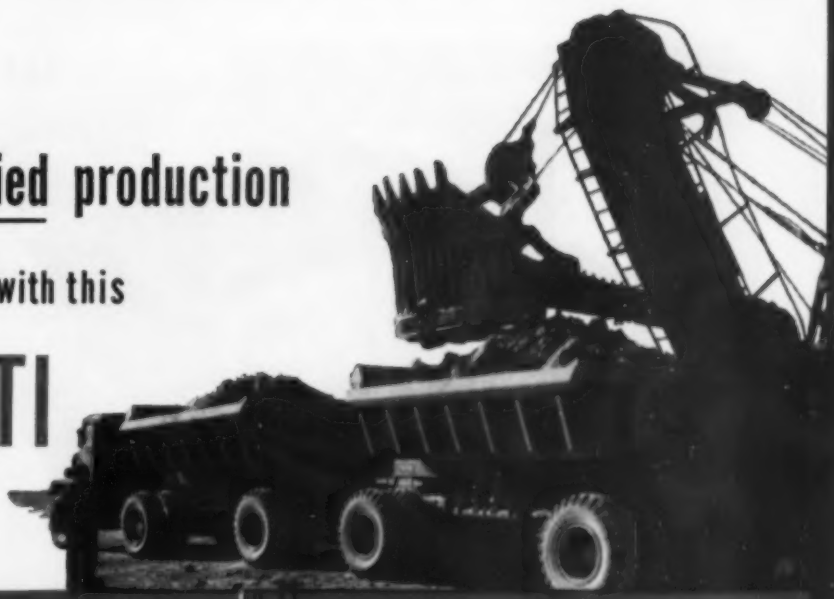
May I thank you for the 12 tear sheets of the article, on p. 114 of the July 12 issue, "Humidity Cabinets Don't Tell the Whole Story" (An accelerated laboratory test, such as the humidity cabinet, shows no correlation with actual field conditions . . .).

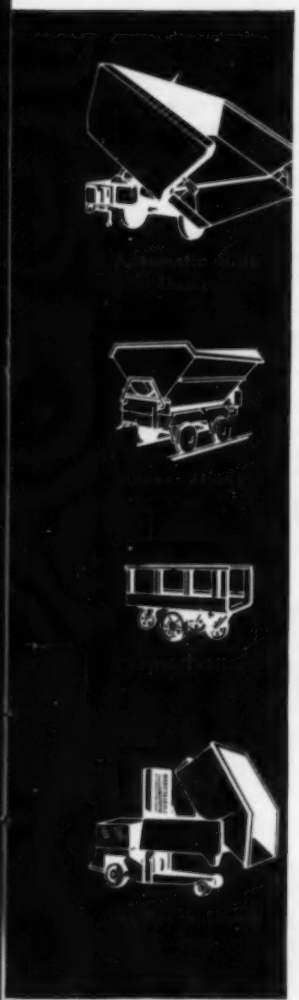
We note that there has been considerable interest in this article. We hope and trust that most of the interest shown was consistent with that of ours. (The American Hot Dip Galvanizers Association Inc. has always maintained that humidity cabinet testing is not a true and accurate method of testing hot dip galvanizing and refuses to accept salt spray test results as applied to zinc coatings by the hot dip galvanizing process.)

I believe the American Society for Testing Materials has taken a similar position. I am also confident that the Bureau of Ships, Navy department, feels pretty much the same way. As you may know, through said Bureau of Ships they are developing a military specification that will cover all of the

(Please turn to page 12)

EASTON simplified production and improved product with this CINCINNATI Press Brake





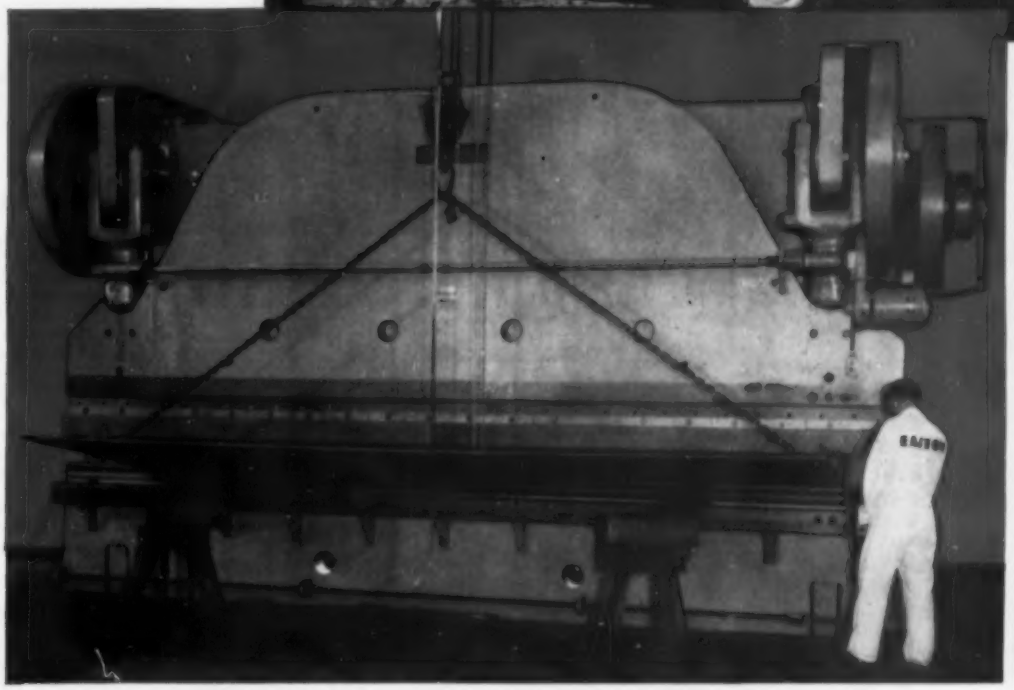


Illustration courtesy Easton Car & Construction Company, Easton, Pennsylvania.

Here a Cincinnati Press Brake is forming ½" plate for wide sections of off-highway trailers, at the Easton Car & Construction Company, makers of a large line of products for industrial transportation.

By using this Cincinnati Press Brake, some welding operations were eliminated, which improved the product, and reduced production costs at the same time.

The power, accuracy, and versatility of Cincinnati Press Brakes are reducing manufacturing costs where ever they are installed. If you form, or bend, you should investigate their possibilities.

Write for Press Brake Catalog B-4.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

NIAGARA Aero HEAT EXCHANGER

Thirty Million B.T.U. CAPACITY

with Precise Control of Temperature in Cooling

The NIAGARA Aero HEAT EXCHANGER cools liquids and gases by evaporative cooling with atmospheric air, removing the heat at the rate of input, controlling temperature precisely. You save 95% of cost of cooling water; you make great savings in pumping, piping, power; quickly recover your installation cost.

You can cool and hold accurately the temperature of all fluids, air and gases, water, oils, solutions, chemical intermediates, coolants for mechanical, electrical and thermal processes. You obtain closed system cooling free from dirt. You solve all the problems of water availability, quality or temperature.

In CHEMICAL PROCESSES this is successfully used in cooling liquids and gases, chemical reactions, condensing distillations and reflux cooling.

Write for complete information; ask for Bulletins 120 and 124. Address Dept. S.

NIAGARA BLOWER COMPANY

405 Lexington Ave. New York 17, N. Y.

District Engineers in Principal Cities of United States and Canada

LETTERS

(Concluded from page 10)

armed forces agencies for their hot dip galvanizing requirements. It is interesting to note that they do not include in any of their testing procedures any reference to the so-called "accelerated salt spray tests."

Stuart J. Swensson
secretary
Hot Dip Galvanizers Association Inc.
Pittsburgh

Call for Steel Guide

Please send me a copy of your "Guide for Steel Buyers," Section II of the July 12 issue.

Harry Hendrickson
Korhumel Steel & Aluminum Co.
Minneapolis

Please send me two copies . . .

A. C. Pollock Jr.
resident manager of sales
Jones & Laughlin Steel Corp.
Kansas City, Kans.

Please send six copies of your "Guide for Steel Buyers" . . .

E. A. Noblet
Armco International Corp.
Middletown, O.

Prices: Lost or Strayed?

In the last two or three issues I have been unable to locate the price tables on imported steel. Have you relocated it . . . or discontinued it? Personally I find this information of considerable value and hope that it still is included in your publication.

W. B. Hays
Tyler & Simpson Co.
Pauls Valley, Okla.

• *In a recent issue or two we omitted the price table on imported steel because of a shortage of space. The prices had not changed. When some occurred, the table reappeared in our Oct. 4 issue. We want to run it as frequently as possible.—ED.*

New Steel Industry Statistics

Please send me 12 copies of the tables depicted in the article, "Coming: Another Wave of Steel Expansion" beginning on p. 111 of the Sept. 20 issue.

C. P. Greenlee
assistant manager of sales
American Steel & Wire Division
U. S. Steel Corp.
District Sales Office
Detroit

Under the heading of "galvanized steel sheets" in the section dealing with Canadian statistics, you show only one producer, Steel Co. of Canada Ltd. Kindly note that, effective Feb. 1, 1954, this company purchased the sheet galvanizing line formerly owned and operated in Hamilton by Lysaght's Canada Ltd.

As of this year, therefore, we should be shown as a producer of galvanized steel sheets, with an annual capacity of 25,000 net tons.

J. J. Enlow
manager galvanizing division
Dominion Foundries & Steel Ltd.
Hamilton, Ont.

• *Thank you for this information.—ED.*

Goodbye to old quench and temper methods!

SEE HOW

Martempering & Austempering CUT COSTS

FOR THESE LEADING MANUFACTURERS!

Shown here are typical examples of important production savings made possible by Ajax Electric Salt Bath martempering and austempering. And there are hundreds more!

Here, briefly, are the reasons for the outstanding superiority of this method: *First cost of equipment is only 1/2 to 1/5 that of any other conventional system!* Distortion is so negligible that parts can usually be finish machined *before* hardening. Final grinding is seldom necessary. Scale, decarb and quench cracks are avoided. Ductility is increased.

WRITE FOR TECHNICAL BULLETIN #500, *"The Present Status of Austempering and Martempering" — also list of documented case histories of martempering and austempering installations covering a wide variety of industries.*

$50,000 Saved ANNUALLY!

Austempering this well-known electric shaver head (0.003" thick) in an Ajax furnace scored a $50,000 a year saving over conventional quench and temper methods! Austempering produced tougher heads. Rejects due to cracks were reduced from 3.6% to .05%. Uniform hardness is obtained. Distortion is easily held within specified limits.

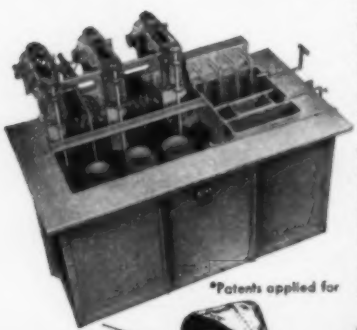
Grinding TIME Cut 80%

Martempered in Ajax furnaces and drawn to Rc 62-63, these SAE-52100 bearing races show an average out-of-round distortion of only 0.002-0.003" in heat treating. Grinding time was reduced from 50 minutes to less than 10 minutes per race.

One Man HANDLES ENTIRE Production

Lawn mower blades (SAE-1065) are austempered in a fully mechanized Ajax salt bath line to produce the critical combination of Rc 48-52 PLUS high ductility. Finished blades can be bent to horseshoe shape without cracking . . . and they're tough enough to cut nails! Production is 550 blades an hour. One man handles the entire job!

Now! A SALT BATH QUENCH THAT SURPASSES OR EQUALS AGITATED OIL!



*Patents applied for

In this new Ajax CATARACT QUENCH furnace* the quenching power of molten salt (400°F and above) surpasses or equals that of agitated oil (100-150°F). This is achieved by a confined downward directional flow within a quench header. Let us prove it on your own products in the Ajax Metallurgical Service Laboratory.

Write for Bulletin 700, "Ajax Cataract Quench Furnaces."

Zero Cracks AND Higher Rc

Section size of this high alloy valve plate varies from 1/2" to 1 5/8". Conventional oil quench and temper methods failed to produce Rc 58-60 without cracking. Martempering and drawing in Ajax salt baths produced a hardness of Rc 60-64 . . . WITHOUT CRACKS!

AJAX electric SALT BATH furnaces

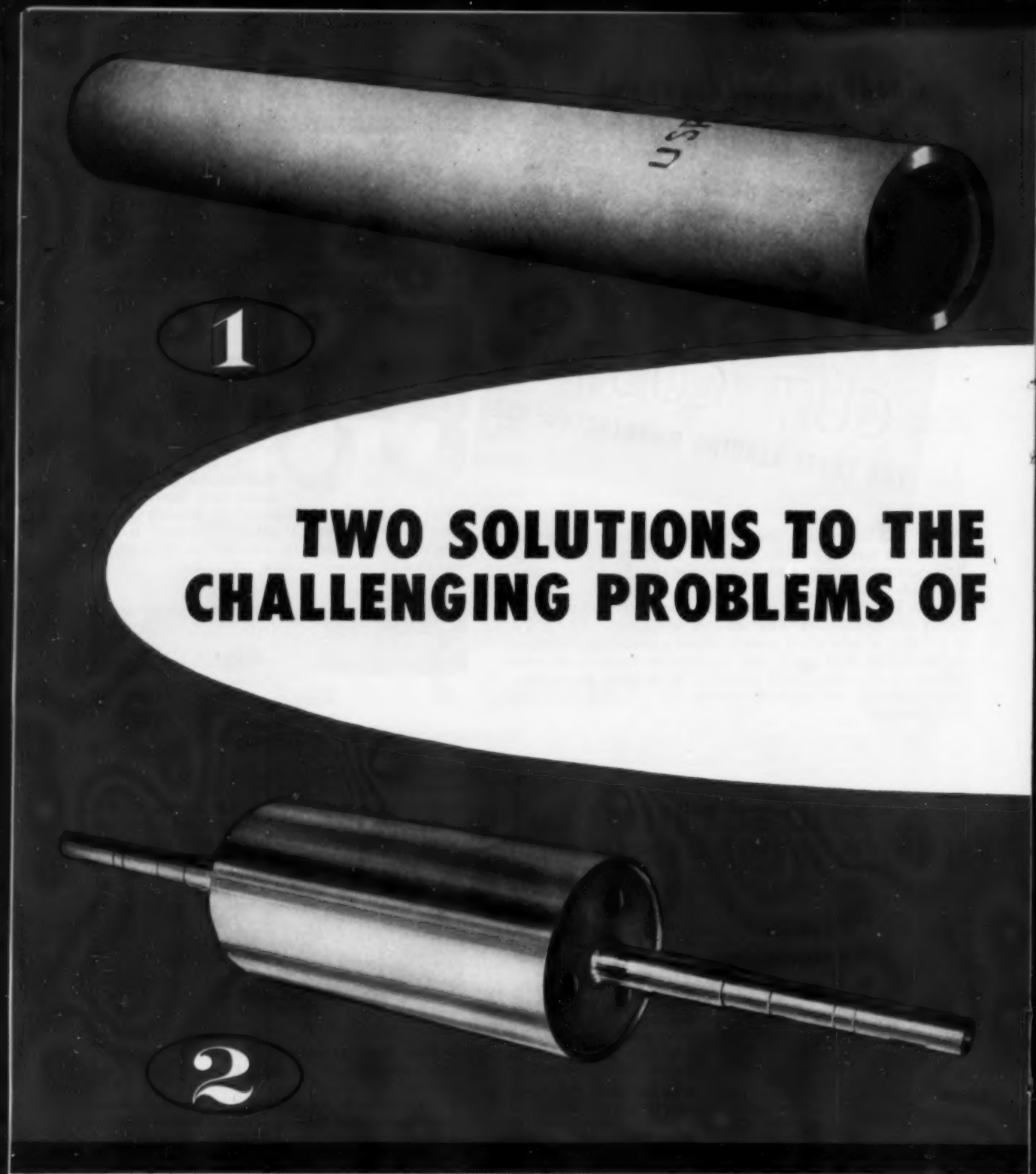
HULTGREN

World's largest manufacturer of electric heat-treating furnaces exclusively

AJAX ELECTRIC COMPANY 952 Frankford Ave., Philadelphia 23, Pa.

Associated Companies: Ajax Electric Furnace Corp. • Ajax Electrothermic Corp. • Ajax Engineering Corp.

SEE US AT THE METAL SHOW—BOOTH 752



TWO SOLUTIONS TO THE CHALLENGING PROBLEMS OF

UNITED STATES PIPE & FOUNDRY CO.

Special Products Division

BURLINGTON, NEW JERSEY

SALES OFFICES: LOS ANGELES, CHICAGO, ST. LOUIS, CLEVELAND, DETROIT, PITTSBURGH, CAMBRIDGE (MASS.), BURLINGTON

HIGH TEMPERATURE

SOUNDNESS AT 2150 F.

1 Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum — a test only the ultimate in soundness and quality could survive.

SURFACE AT 1400 F.

2 The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

"METAL MOLD" CENTRIFUGAL CASTINGS

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter	4" to 30"
Wall Thickness	⅜" and up
Length	Up to 14' in the "as-cast" condition
Type of Stainless Cast	All Standard AISI and ACI grades of ferritic and austenitic stainless plus "Special" types

You'll Cut Faster and Cut Costs with

Victor BLADES

The secret is simply in selecting the *right* Victor blade for the job you have to do, and one of these four *is* the right one — Victor "Moly"® High Speed Steel — Challenges all comparison as to economy and performance. Victor "Molyflex"® High Speed Steel — Cuts like a genuine "Moly" but is so flexible it cannot be broken in use. Victor High Speed Steel — The power blade that's unexcelled for fast cutting and durability. Victor Unbreakable High Speed Steel — Absolutely shatterproof and unbreakable when in use. Fast cutting, flexible, long-lasting.

Your Victor Distributor Can Guide Your Choice

Ask him for the Victor Metal Cutting Booklet — a concise guide to blade selection for hand, power and bandsaw work. Depend on him for quick delivery of the *right* Victor blade from local stock. Use him as your source of supply for hundreds of the other items you need to keep your production uninterrupted.

Sold Only Through Recognized Distributors

1031

VICTOR

SAW WORKS, INC. · MIDDLETOWN, N. Y., U. S. A.
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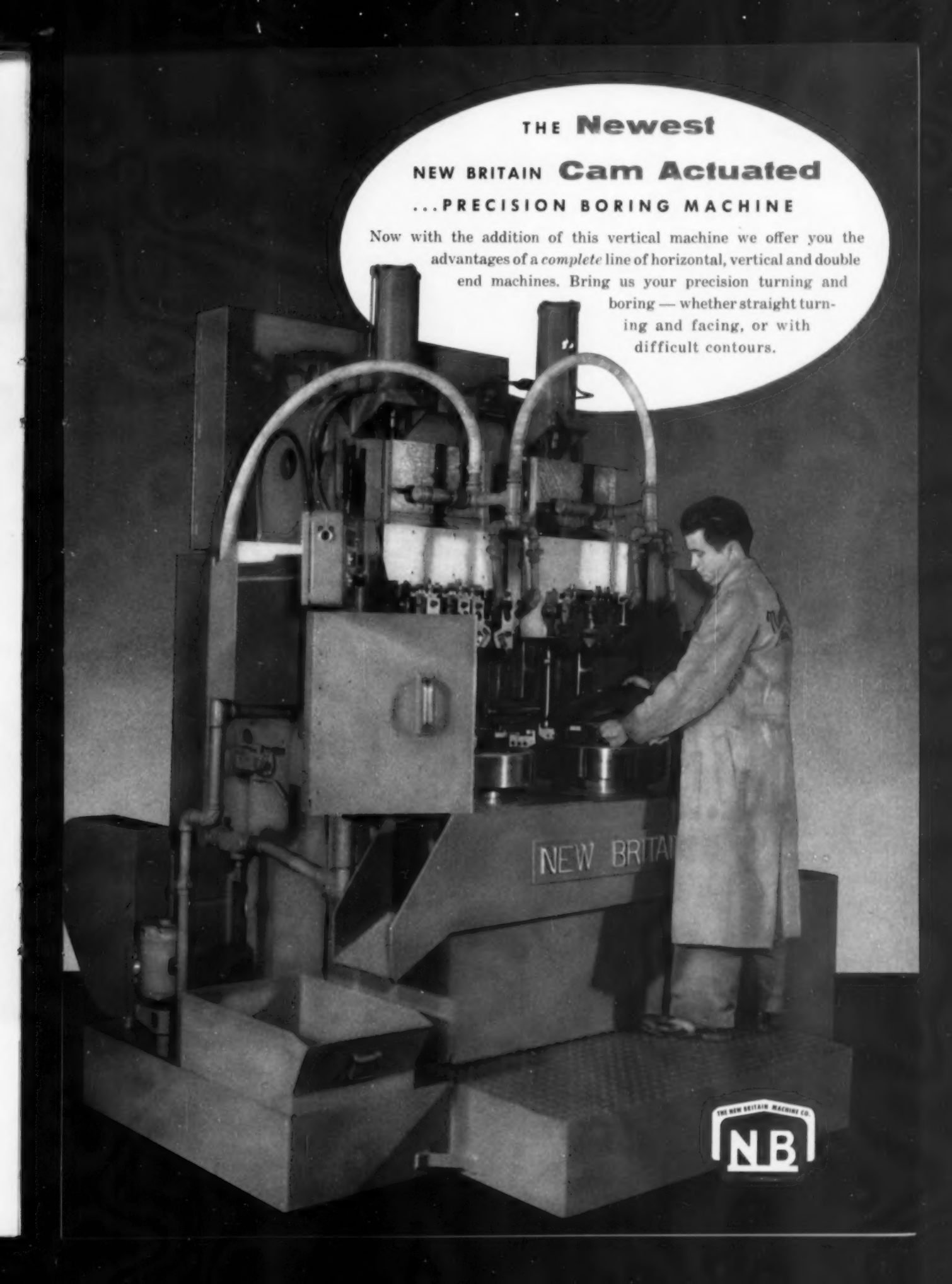
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NEW BRITAIN Cam Actuated
...PRECISION BORING MACHINE
Now with the addition of this vertical machine we offer you the advantages of a *complete* line of horizontal, vertical and double end machines. Bring us your precision turning and boring — whether straight turning and facing, or with difficult contours.
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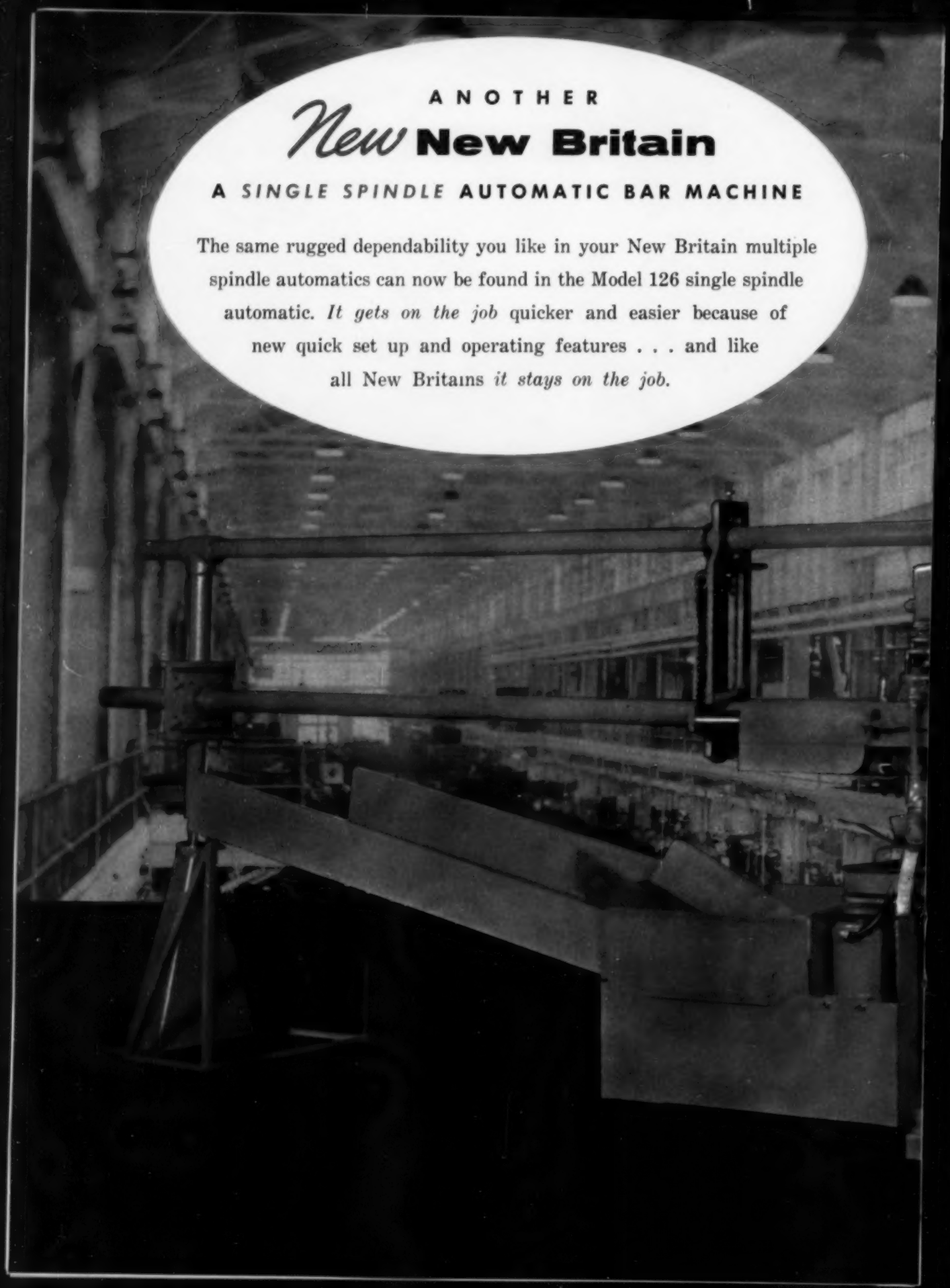
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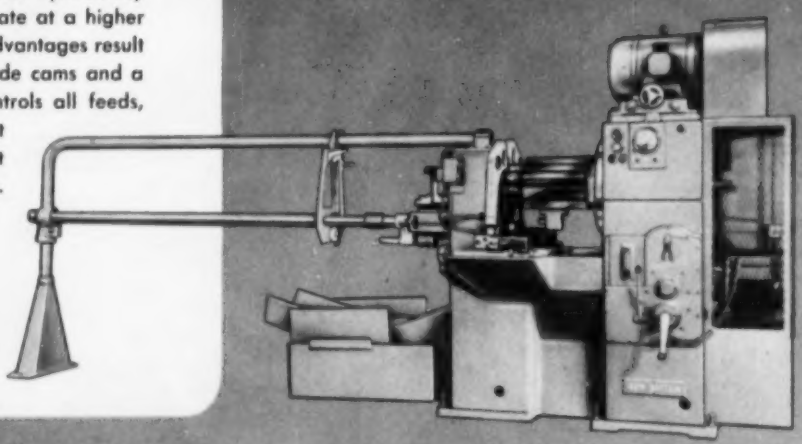
New New Britain
A SINGLE SPINDLE AUTOMATIC BAR MACHINE
The same rugged dependability you like in your New Britain multiple spindle automatics can now be found in the Model 126 single spindle automatic. It gets on the job quicker and easier because of new quick set up and operating features . . . and like all New Britains it stays on the job.

New Britain
Automatics

NEW BRITAIN CAM-CONTROLLED PRECISION BORING AND TURNING MACHINES reproduce size and finish with absolute certainty, piece after piece, hour after hour, day after day. The model illustrated generates all types of radii, chamfers, undercuts, grooves, faces, etc.; plus straight boring and turning. This simple, accurate high speed machine reduces manufacturing costs on a wide variety of sizes and types of piece.

NEW BRITAIN DOUBLE END TOOL OR WORK ROTATING PRECISION BORING MACHINE specifically designed for products requiring the most exacting accuracy at high production rates. Tooling set ups and types of pieces machined are practically unlimited. Both double end and single end jobs can be profitably produced on this machine by the use of its automatic cycling features.

NEW BRITAIN MODEL 126 SINGLE SPINDLE AUTOMATIC was designed specifically to reduce "down time" and operate at a higher percentage of efficiency. These advantages result from pre-set wedge-type cross slide cams and a central program drum which controls all feeds, speeds and sequences. Inherent simplicity and adaptability make it ideal for both long and short runs.



Our general catalog is filed in the Sweet's Machine Tool Catalog File.

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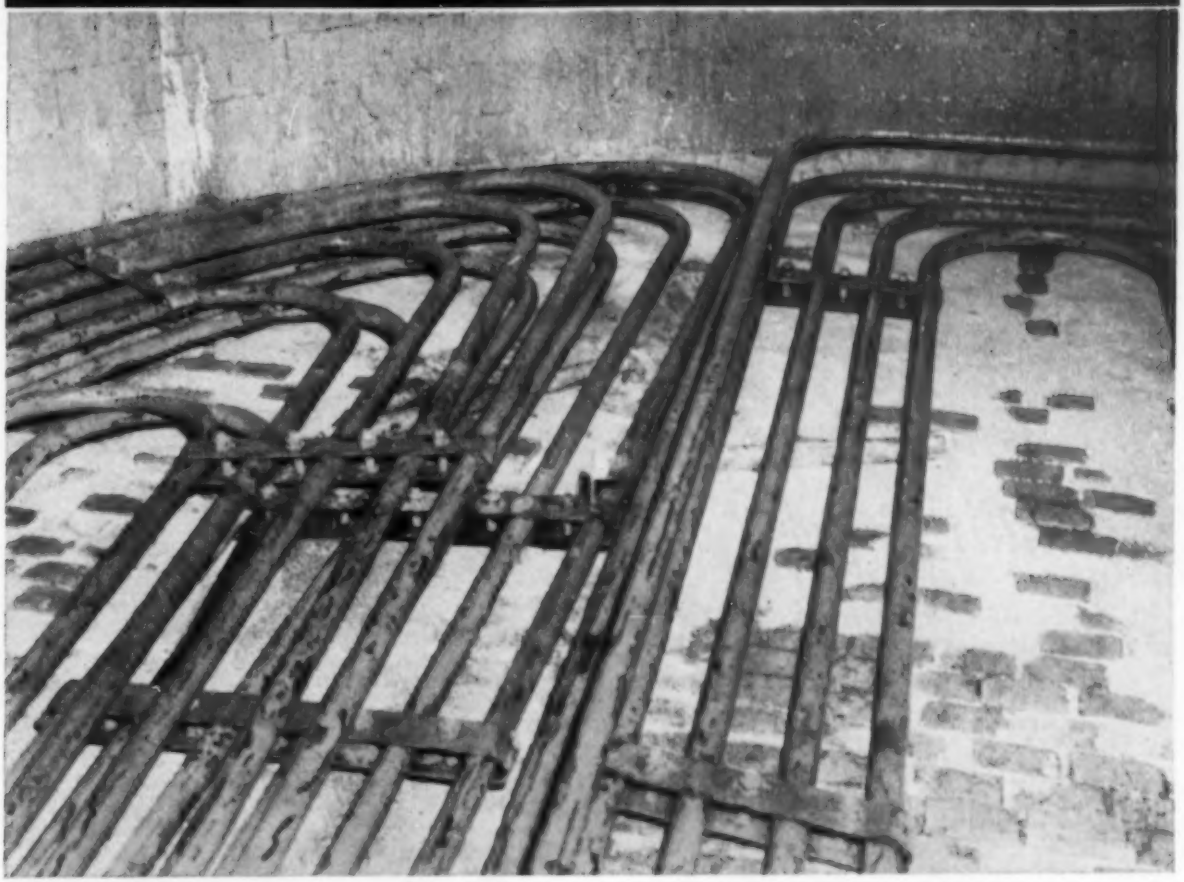
LUCAS HORIZONTAL BORING, DRILLING and MILLING MACHINES
NEW BRITAIN +BF+ COPYING LATHES

The NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division, New Britain, Connecticut

Alum Evaporator Coils of *Carpenter* Stainless No. 20Cb



Life Expectancy 25 Years . . . Trouble-Free!

A large chemical manufacturing company had a problem with heating coils for alum solutions of 8½ to 17%, at temperatures from 115 to 120°C. Continual repairs were needed, costly time-consuming down-time was frequent, steam leaks into the solution made quality almost impossible to maintain.

They switched to Carpenter Stainless No. 20Cb tubing for coils . . . to Carpenter Stainless No. 20 bar and strip for braces, hangers and fasteners. Down-time and coil repairs are a thing of the past. Steam leaks have been eliminated. Corrosion rate is estimated at .001" penetration per year. A useful life of 25 years or more is expected of these coils!

You may not have a precisely parallel problem. But if corrosion is costing you too much, if you are handling strong acids and other severe corrodents, write today for the NEW Carpenter Stainless No. 20 BULLETIN. It may be the cure for your biggest headache.

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.
Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter
Stainless Tubing & Pipe

FOR INFORMATION . . . *on Carpenter Stainless No. 20 tubing, pipe, sheet, plate and bars, contact The Carpenter Steel Company, Alloy Tube Division, Union, N.J. . . . on Carpenter 20 strip, wire, bars and billets, contact The Carpenter Steel Company, Reading, Pa.*

FIRST

Humboldt Mine
Steffensen Flotation Machine

...to use a flotation process to convert lean "specular jaspery" ore

At the plant of the Humboldt Mining Company, Ishpeming, Michigan, this process was first applied to produce concentrates from jasper rock. The accompanying photographs show some of the operations. This plant, owned jointly by the Cleveland-Cliffs Iron Company and the Ford Motor Company can turn out more than 200,000 tons of high grade ore per year.

Close-Up Steffensen Flotation Machine

General View of Humboldt Mine

LAKE SUPERIOR IRON ORE • VESSEL TRANSPORTATION • COAL • FERRO ALLOYS

THE Cleveland-Cliffs IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

Costs less to use!

As THE industry's *highest quality* maintenance material, Permanente 84 keeps steel furnace bottoms in good operating condition with *less material* than usually required.

Thus, it actually *costs less* to use Permanente 84 than materials with a lower initial cost.

Leading steel producers report that Permanente 84, by lasting longer, helps cut down-time for maintenance and repair as much as 50%!

This means Permanente 84 makes possible more steel at lower cost per ton.

Order Permanente 84 now, and get that extra tonnage! It's your *best buy* for bottom, bank and tap hole maintenance. Also ideal for open hearth and electric furnace rebuilds.

For complete information contact *Kaiser Chemicals Division,* Kaiser Aluminum & Chemical Sales, Inc. Regional sales offices: OAKLAND 12, California, 1924 Broadway; AKRON 8, Ohio, First National Tower; CHICAGO, 518 Calumet Bldg., 5231 Hohman Ave., Hammond, Indiana.

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Pioneers in Modern Basic Refractories

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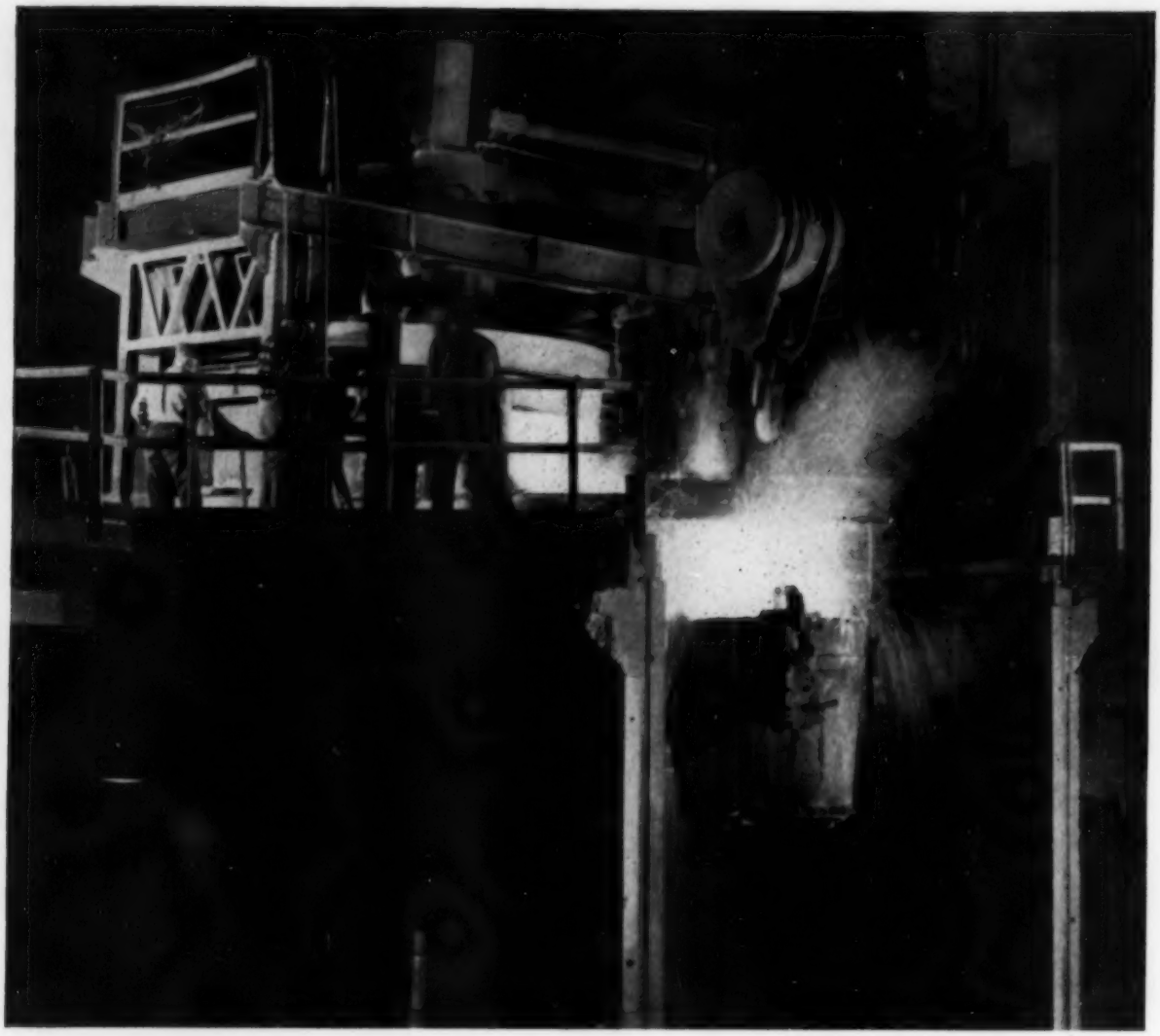
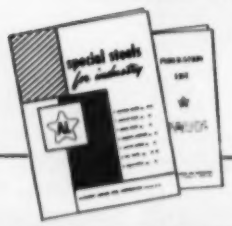


Can we pour a "cup" for you?



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For These Publications

1. SPECIAL STEELS FOR INDUSTRY . . . 16 pages of essential data on the proper selection and application of principal AL special alloy products: stainless, tool and electrical steels and sintered carbides.

2. PUBLICATION LIST . . . a complete listing of all AL publications, both technical and non-technical (over 100 in all), with a handy order form for your convenience.

ADDRESS DEPT. S-581

Somewhere in your setup, there's a spot where one of our special alloy steel products (stainless or heat-resistant, tool or electrical) can be used to gain you a real advantage. *Right now!* It might come from reduced production, maintenance or depreciation costs. Or it might come from increased sales appeal: gaining an edge on competition in beauty, strength, service life or performance. The advantage is *there*—and our Research and Engineering Staffs are ready to help you find it. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

PIONEERING on the Horizons of Steel

Allegheny Ludlum

WSD 5144-B

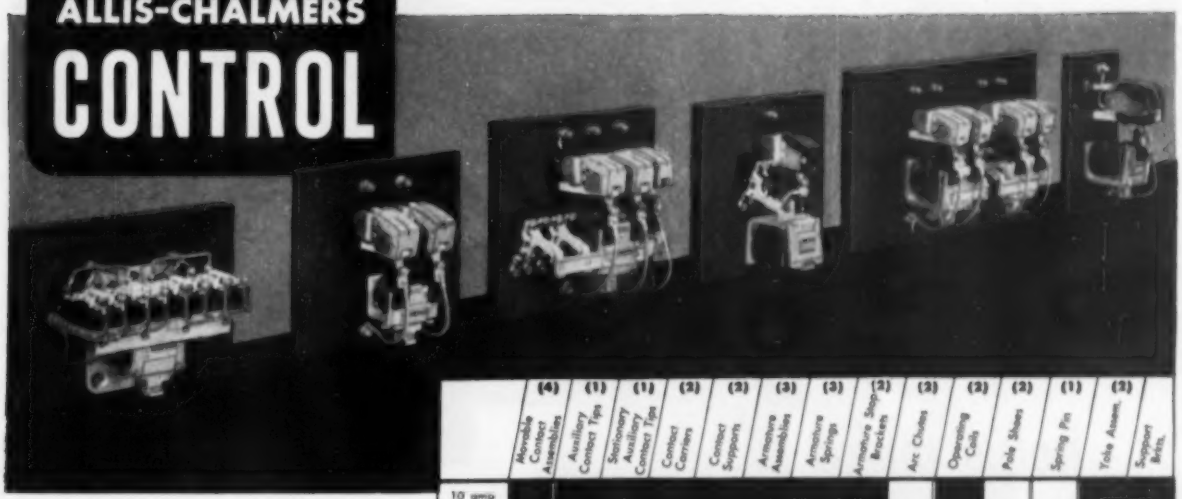
Stocks of Allegheny Stainless carried by all Ryerson Steel warehouses

AL®
LEADING PRODUCER
HIGH-ALLOY STEELS

For 10 to 100 AMP applications

Check this New dc Control Line

ALLIS-CHALMERS CONTROL



	(4) Movable Contact Assemblies	(1) Auxiliary Contact Tips	(1) Stationary Auxiliary Contact Tips	(3) Contact Carriers	(2) Contact Supports	(3) Armature Assemblies	(3) Armature Springs	(2) Armature Stop Blocks	(3) Arc Chutes	(3) Operating Coils	(2) Pole Shoes	(1) Spring Pin	(2) Yoke Assem.	(2) Support Brkts.
10 amp Type 521 Relay														
25 amp Type 522-1 Contactor														
50 amp Type 522-2 Contactor														
Special Type 522-2 50 amp Contactor														
100 amp Type 522-3 Contactor														

Change in color bar indicates size change. Number in parentheses tells how many sizes of that component are needed.

• This new line of general purpose, heavy-duty dc control starts with a multi-pole auxiliary relay and includes contactors ranging from 25 to 100 amps. The contactors are available in five basic units with optional arrangements of normally open and normally closed main and auxiliary contacts.

Outstanding Interchangeability of Parts Affords Maximum Convenience and Economy

This chart graphically illustrates the exceptional interchangeability of parts in this new control line. Maintenance is greatly simplified. Only a small inventory of parts is needed to keep these controls operative. The possibility of lengthy, costly "down" periods is practically eliminated.

Other Features — Vertical action contactors have a rolling, self-wiping action. Contactor tips are forged copper. Current-carrying parts are silver plated. All other metallic parts are zinc plated. Relay tips are silver alloy.

A-4448

New Bulletin — Bulletin 14B8171 gives data on the Allis-Chalmers dc line which now covers the *complete range up to 600 amperes*. See your local Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS

Quick Delivery

helps make

USS Amerstrip

America's preferred strip steel

• Eliminate late delivery that fouls up production schedules; eliminate early delivery that ties up valuable warehouse space—specify USS Amerstrip. We can schedule your steel for shipment exactly *when* you want it because we have the largest strip-producing facilities in the steel industry. Delivery *on time* is one reason why USS Amerstrip is more widely used in a greater variety of products than any other strip steel.

Amerstrip comes in a wide range of analyses and tempers in carbon, stainless, and alloy steels . . . in coils or cut lengths . . . with a round or square, natural or rolled edge . . . in *all* commercial finishes.

If you have any question about the selection or use of strip steel, write to American Steel & Wire, Room 842, Rockefeller Building, Cleveland 13, Ohio. Our steel specialists can help you.

Amerstrip

USS

CARBON · ALLOY · STAINLESS

AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

CALENDAR
OF MEETINGS

October 18-19, Annual Boston Conference on Distribution: Hotel Statler, Boston. Information: Daniel Bloomfield, director, 80 Federal St., Boston 10.

October 18-19, American Society of Mechanical Engineers and American Society of Lubrication Engineers: Joint national lubrication conference, Hotel Lord Baltimore, Baltimore. Information: ASME, 84 E. Randolph St., Chicago 1.

October 18-20, Society of Automotive Engineers Inc.: National transportation meeting, Sheraton-Plaza hotel, Boston. Society address: 29 W. 39th St., New York 18. Secretary and general manager: John A. C. Warner.

October 18-22, American Society of Civil Engineers: Annual meeting, Statler hotel, New York. Society address: 33 W. 39th St., New York. Secretary: Col. Wm. N. Carey.

October 19, American Society of Safety Engineers: Annual meeting, Conrad Hilton hotel, Chicago. Society address: 425 N. Michigan Ave., Chicago 11. Secretary and managing director: Jasper J. Johnson.

October 19-20, American Machine Tool Distributors' Association: Annual meeting, Sheraton-Gibson hotel, Cincinnati. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thos. A. Fernley Jr.

October 20, American Iron & Steel Institute: Regional closed technical meeting, Hotel Thomas Jefferson, Birmingham. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 20, Material Handling Institute Inc.: Top management conference, Drake hotel, Chicago. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director: R. Kennedy Hanson.

October 20-21, Steel Shipping Container Institute Inc.: Fall meeting, Pierre and Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

October 20-23, American Management Association: Annual office management conference, Hotel Astor, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

October 20-22, National Industrial Leather Association: Annual meeting, Hotel Commodore, New York. Association address: 320 Broadway, New York. Secretary: E. R. Rath.

October 21-22, National Noise Abatement Symposium: Illinois Institute of Technology, sponsor. Address: 35 W. 33rd St., Chicago 16. Director of public relations: Stewart B. Howe.

October 21-23, American Society for Quality Control: New England conference, Ten Eyck hotel, Albany, N. Y. Society address: Southern Connecticut Section, Box 1681, Bridgeport 1, Conn.

October 24-27, American Gear Manufacturers Association: Semi-annual meeting, Edgewater Beach hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: J. C. Sears.

October 25-26, Rail Steel Bar Association: Fall meeting, Edgewater Beach hotel, Chicago. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

October 25-27, National Lubricating Grease Institute: Annual meeting, Mark Hopkins hotel, San Francisco. Institute address: 4638 J. C. Nichols Parkway, Kansas City, Mo. Executive secretary: Harry F. Bennetts.

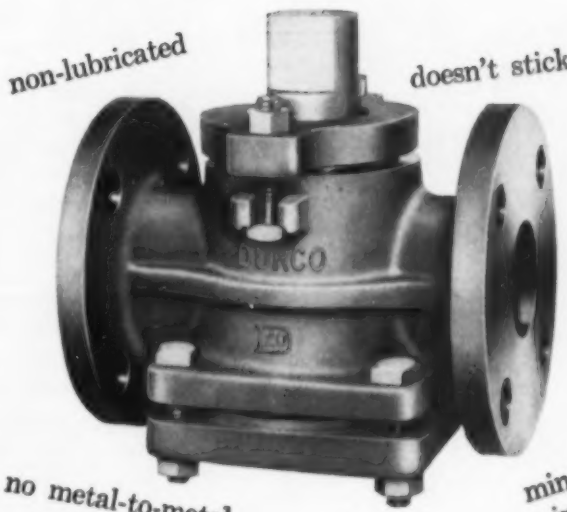
October 25-27, Packaging Institute: Annual meeting, Hotel Roosevelt, New York. Institute address: 342 Madison Ave., New York 17. Executive director: Lawrence V. Burton.

October 25-27, American Institute of Electrical Engineers: Machine tool conference, Statler hotel, Detroit. Institute address: 33 W. 39th St., New York 18. Secretary: N. B. Hibshman.

October 25-28, American Institute of Steel Construction Inc.: Annual meeting and exhibit, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 101 Park Ave., New York 17. Secretary: M. Harvey Smedley.

the valve for

66° Bé Sulfuric Acid service



DURCO type F valve

Available in sizes ¼" through 2".
Why not mail the coupon for full details?

The Duriron Company, Inc. Dept. S
Dayton, Ohio

Please send details on Durco Type F Valve.

Name_____

Company_____

Address_____

City_____ State_____

Big, New HEAVY-DUTY SECO 48" SLITTING LINE

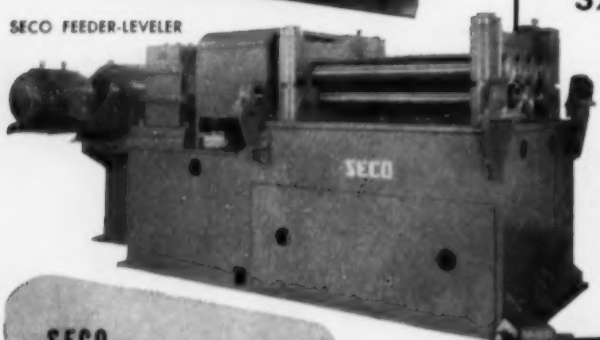
SECO PAYOFF REEL

Sets New Standards

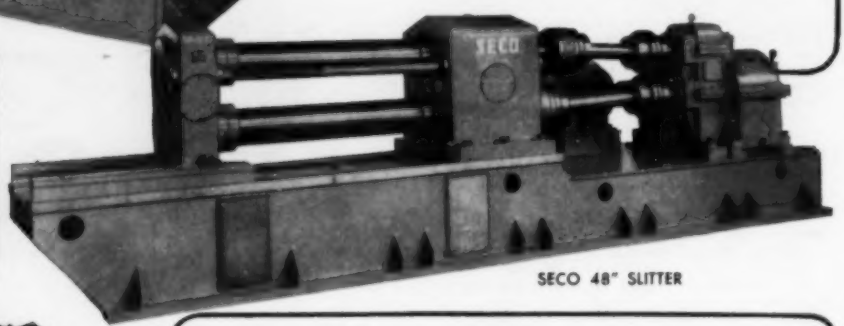
- in Performance and Production
- in Fast, Profitable Operation
- in Safe Handling of Coils Up to 32,000 Pounds

This rugged new SECO Slitting Line handles steel ¼" thick in coils 48" wide, weighing up to 32,000 pounds. The efficient, streamlined SECO Slitter, shown below, makes seven cuts in .250" stainless or low carbon steel at slitting speeds of 100 to 400 feet per minute. This slitter has overrunning clutches for pull-thru slitting. Arbors are 9½" diameter with 16" knives.

SECO FEEDER-LEVELER



SECO SLITTING EQUIPMENT— the latest in design, engineering and efficiency



SECO 48" SLITTER

SECO TENSION REEL

Exceptional quality and accuracy are built into each piece of SECO equipment—assuring efficient, trouble-free, high production.

The Payoff Reel (top left) is of the positioning type, with power feed-up. The Feeder-Leveler is, like other SECO equipment, of the most modern design. The Tension Reel (left) has a 54" long automatic block, 22" in diameter, hydraulic stripper, 250 H.P. motor.

Call or write SECO on your requirements for slitters or other cold-rolled strip mill equipment. We're glad to furnish full information—no obligation. Our years of engineering experience and complete plant facilities are at your service.

SECO

STEEL EQUIPMENT CO.

20805 AURORA ROAD • CLEVELAND 22, OHIO

Higher speeds in critical metal working are here for plants using the Pennsalt Fos Process. They can cold form steel piston pins, torque tubes, gear blanks, hydraulic cylinders and other vital parts in presses. And the finished products are tougher, stronger, better able to withstand the demands of higher speeds and harder wear than parts made by conventional methods.

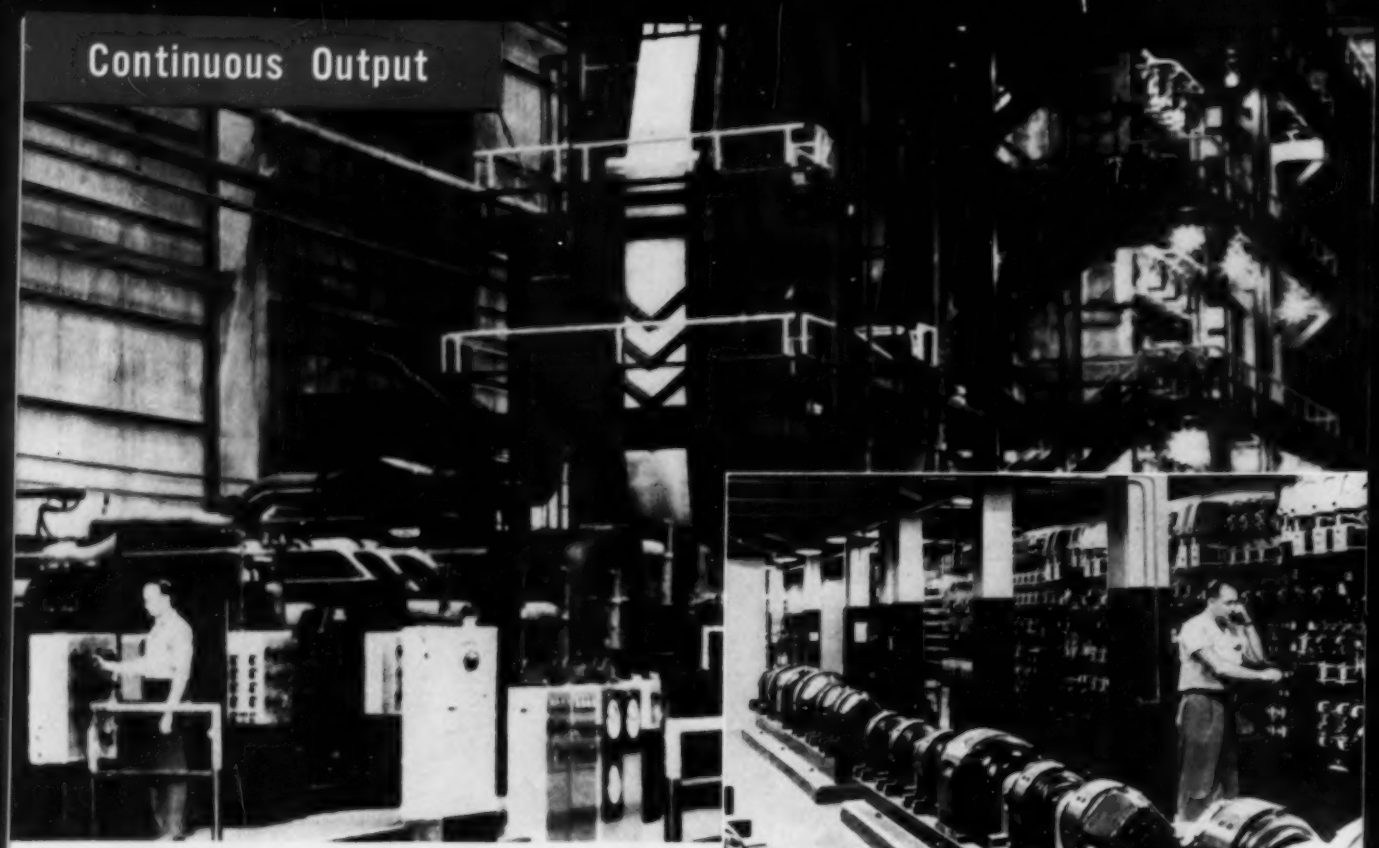
The Pennsalt Fos Process is now being used in automotive, tube, wire drawing and ordnance plants. The process includes a new Pennsalt lubricant and a proven method of locking the lubricant to the steel. The Fos Process insures the smooth and rapid flow of cold steel through the die, even at extreme pressures.

Practically all of the original metal can be utilized with Pennsalt cold extrusion techniques . . . work cycles can be reduced...and over-all production speeded up. Superior physicals can be obtained from carbon steels, along with a better, smoother finish. Multiple draws without interim recoating and annealing, and greater reductions per draw are now practical.

Is Fos Process practical for your plant...your products? Send us details of desired application, or blueprints of products. We'll be glad to evaluate possibilities. Metal Processing Department, 504 Widener Building, Philadelphia 7, Pa.

Pennsalt Chemicals

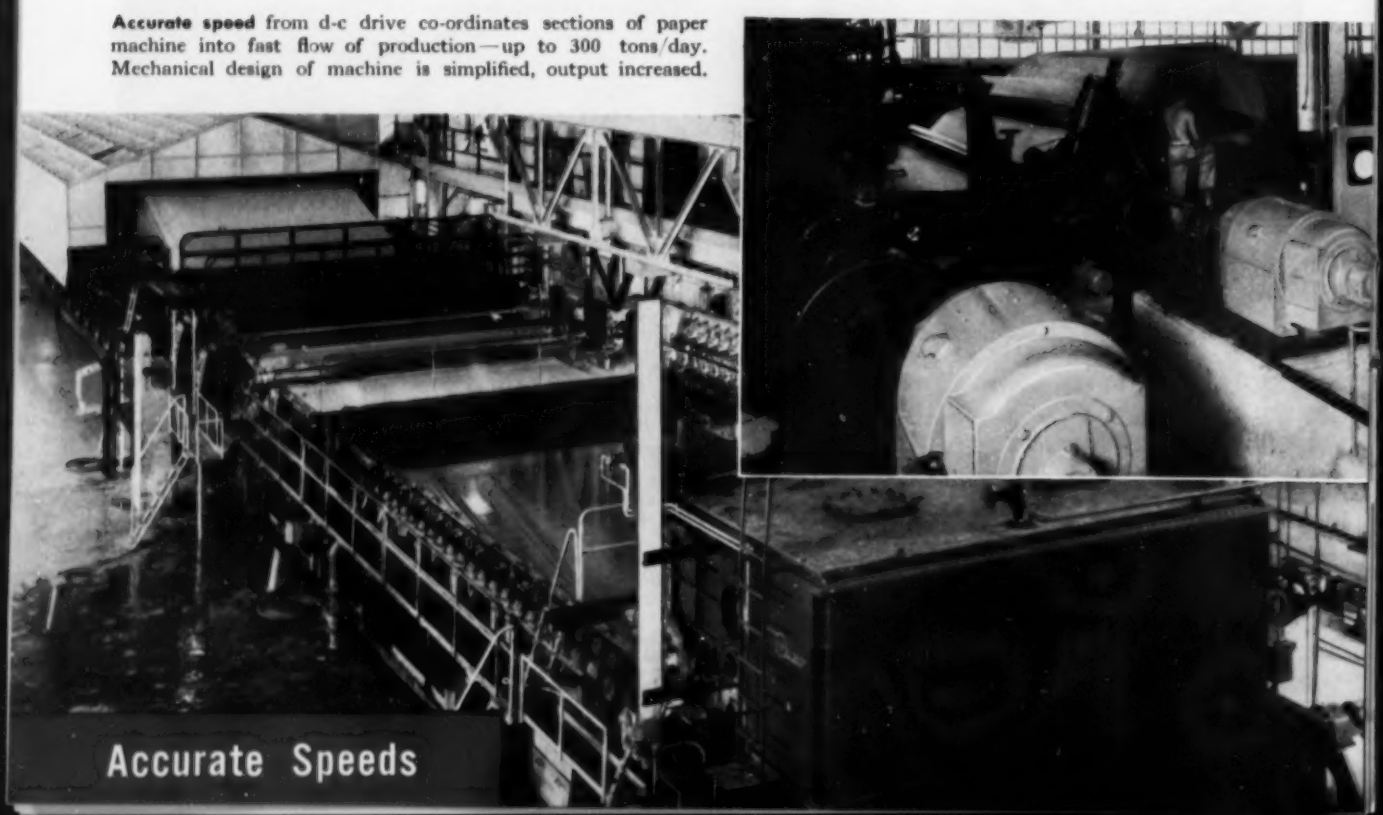
Pennsylvania Salt Manufacturing Company



Co-ordinated G-E drive and furnace help produce up to 30 tons/hour of annealed strip. Adjustable voltage d-c generators co-ordinated by modern control provide smooth, fast, precise operation.

How General Electric d-c drives

Accurate speed from d-c drive co-ordinates sections of paper machine into fast flow of production—up to 300 tons/day. Mechanical design of machine is simplified, output increased.



Controlled Power

Controlled cutting power is provided by unit-cooled d-c motors. Torque and speed of this boring mill for diesel engine blocks is maintained at optimum point for long tool life and top production.

help make production automatic

DC MOTORS STEP UP PRODUCTION THROUGHOUT INDUSTRY

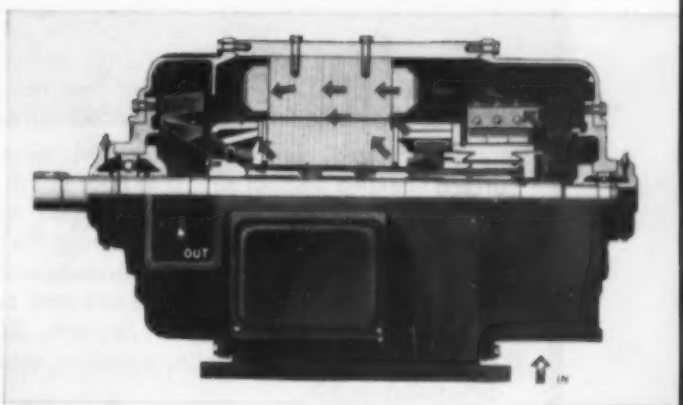
DC drives give you precise control of torque, speed, and power—essential in automatic production. The degree of precision depends on the steady performance and continuity of service of d-c motors and generators. In applications requiring close speed regulation, quick reversing, severe peak loads, G.E.'s complete line of Type CD-1000 motors is:

ECONOMICAL—the right speed at all times means less waste, fast production and low manufacturing costs per unit.

EASY TO MAINTAIN—built for long life with occasional inspection only—easily removable inspection covers. All connections are enclosed, yet easily accessible.

VERSATILE—Today's industry is more automatic than ever before. Regardless of application—in steel, paper, machine tool, and many other industries—G-E direct-current motors have gained the reputation of delivering continuous output at lower costs and accurate speeds for peak production.

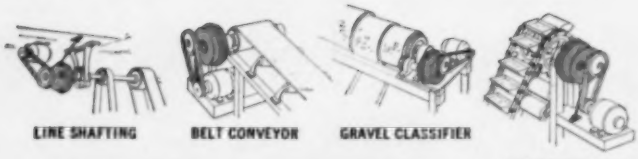
FOR MORE INFORMATION, contact your nearest Apparatus Sales representative, or write for bulletin GEA-5497, general-purpose d-c motors, or GEA-6091A, totally-enclosed unit-cooled d-c motors. Section 810-4, General Electric Co., Schenectady, N. Y.



Excellent ventilating system gives positive ventilation to entire motor. Shaft fan on armature helps dissipate heat, keep within specific temperature rise.

GENERAL ELECTRIC

Falk ALL-STEEL Shaft Mounted Drives

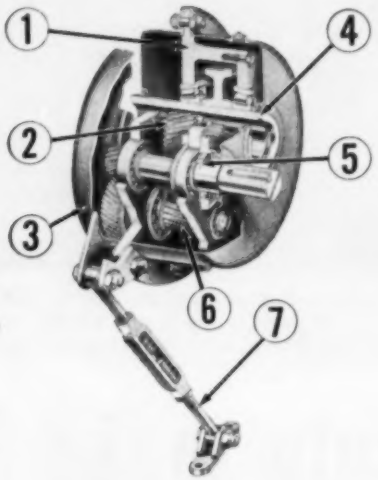


APPLICATIONS UNLIMITED

The range of applications to which the all-steel Falk Shaft Mounted Drive is ideally suited is so wide that complete listing is impracticable. The sketches above are included only to indicate a few typical installations where considerable speed reduction in limited space is an important advantage.

SIX SIZES

- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm



These versatile, NEW speed-reducing units

save space, power, material and time

Here is the economical solution to the countless application problems requiring efficient speed reduction in limited space! The new Falk all-steel Shaft Mounted Drive—a modification of the universally-accepted Falk Motoreducer design—embodies many exclusive structural and functional features which add up to better service, longer life and substantial savings.

This rugged, compact drive mounts directly on the driven shaft—a distinct saving in floor space. Its precision Falk helical gearing gives highest mechanical efficiency, with a resultant power saving. No adjustable motor bases or slide rails are required. Installation is simple and rapid—output speeds can be quickly changed; thus time is saved...Write to Department 247 for engineering bulletin, including selection and dimension details.

FALK "In-Built" Factors... that give maximum efficiency, convenience and dependability

1 **All-steel Frame,** with more than double the rigidity of iron, supports all rotating elements.

2 **Precision Helical Gears,** designed and machined by Falk, rated to AGMA standards.

3 **Pressed Steel Housings,** whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismounting unit.

4 **Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.

5 **Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.

6 **Positive Lubrication,** continuous direct dip of revolving elements at all speeds.

7 **Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

THE FALK CORPORATION, Milwaukee 8, Wisconsin

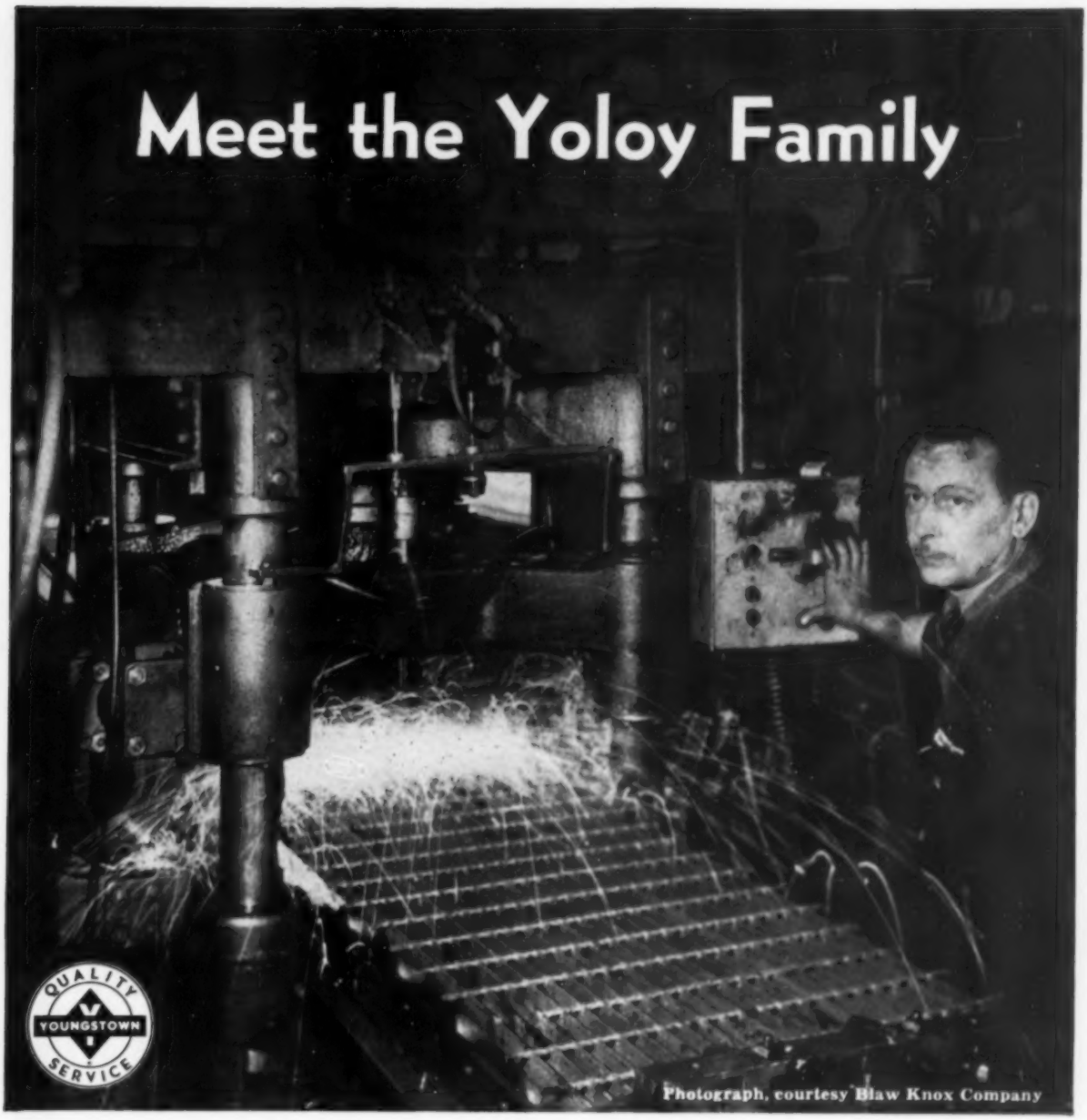
MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

Meet the Yoloy Family



Photograph, courtesy Blaw Knox Company

●The Yoloy Family of steels are available to fabricators and users who require a steel that's high in resistance to corrosion, shock, vibration and is easy to fabricate and weld. The illustration shows fabrication of "Electro-forged"* grating, using Yoloy E steels, where long life and safety require superior properties. Phone or write our nearest District Sales Office for further information.

*Registered—Blaw Knox Company

Youngstown

YOLOY *(Nickel-Copper)* Low Alloy High Strength Steel
YOLOY E *(Nickel-Chrome-Copper)* Low Alloy High Strength Steel
YOLOY C *(Chrome-Copper)* Corrosion Resistant Steel

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

At the '54 Metal Exposition—Nov. 1-5 . . .

50,000-PLUS METALS INDUSTRIES MEN

WILL LEARN NEW WAYS OF CUTTING COSTS!

Your competitors . . . thousands of 'em . . . will be on hand at this great industrial event to check closely on everything that's new and improved . . . everything that will help them build better products . . . cheaper . . . faster!

They'll come from all corners of the land . . . these 50,000-plus metals industries men . . . and they'll take away with them, when this great Metal Show ends, more ideas . . . more information and more know-how than any 'stay-at-home' executive could possibly match!

Owned and Managed by

AMERICAN SOCIETY FOR METALS

W. H. Eisenman, *Managing Director*

Chester L. Wells, *Ass't. Director*

INTERNATIONAL AMPHITHEATRE
CHICAGO NOV. 1-5

NATIONAL METAL EXPOSITION

NATIONAL METAL CONGRESS

HOT ASPHALT pours into new Morania No. 160 barge. Double-hull construction and double heating coils are designed to maintain cargo at workable temperatures.

Want to ship a 40-mile highway somewhere?

You could pave a two-lane highway from Baltimore to Washington with the hot asphalt this new steel barge can haul — and pave another three miles besides.

Designed and built by Barium's Wiley Manufacturing Co., Port Deposit, Md., for Morania Oil Tanker Corp., the 240-ft. Morania No. 160 is now running from Baltimore, Md., or Barber, N.J. to points on the N.Y. State Barge Canal and ports on the Atlantic coast, principally moving asphalt of the American Bitumuls & Asphalt Co. It has made a big splash in maritime circles because (1) it holds as much asphalt as 67 railroad tank cars and (2) it's the only barge designed to operate in both inland and coastwise service.

What's more, on her first trip, the Morania No. 160 hung up a new record for discharging — 16,000 barrels in seven hours!

However, full utilization of low-cost water transport also calls for strategically located terminals specially designed for heated bulk storage of asphalt. Here, too, Barium has the answer — Wiley can design, engineer, fabricate and erect new-design terminals under a turn-key contract.

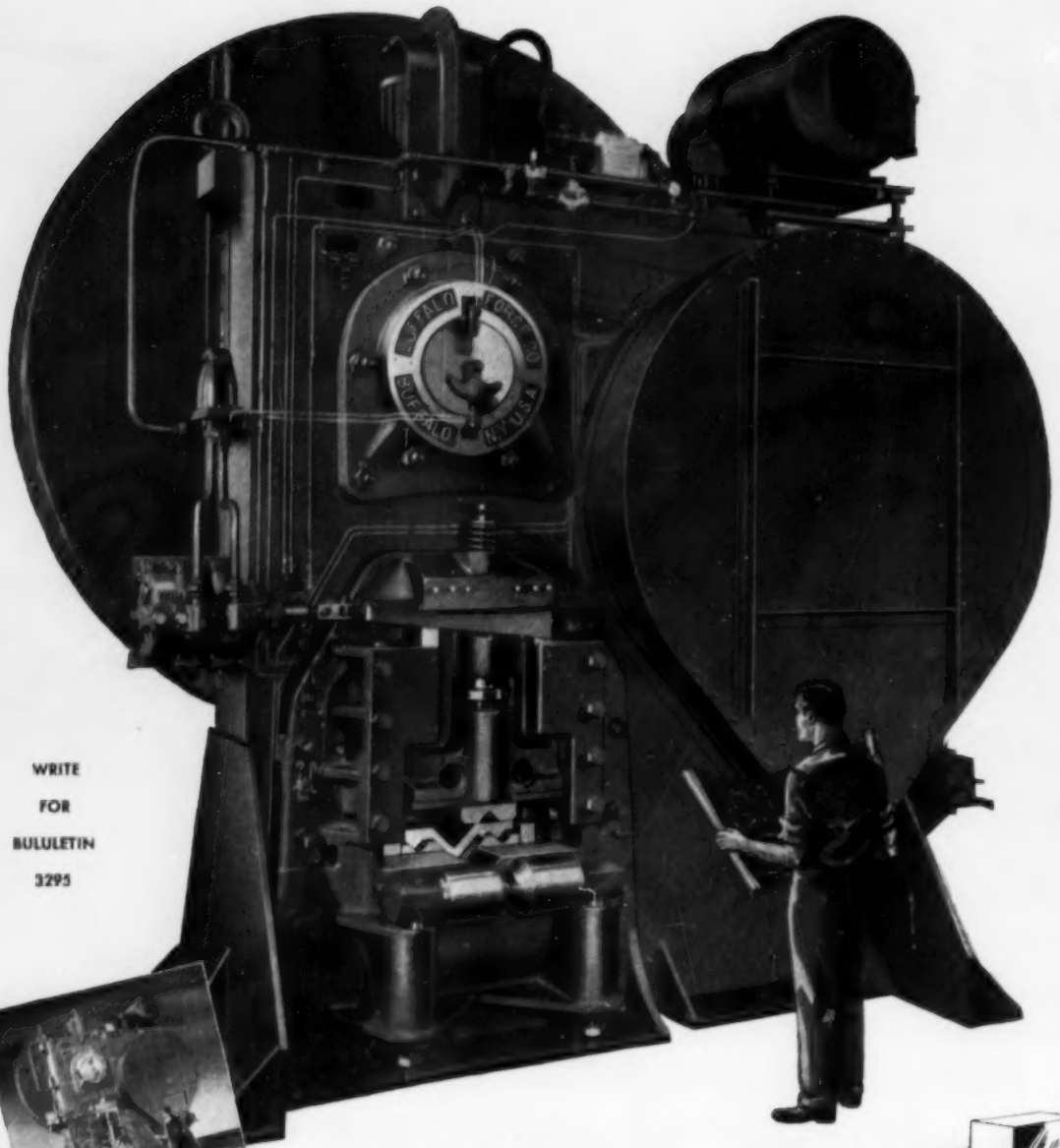
You can also see in this barge more evidence of Barium's "integrated operations". Wiley builds it, but Barium's Central Iron & Steel and Phoenix Iron & Steel supply plate and structural steel respectively.

A long list of firms have learned to expect this type of joint action from Barium's 16-company team. We're saving a copy of "The Barium Story" for you, if you'd like to know more. BARIUM STEEL CORPORATION, 25 Broad St., New York City 4.

4.20

16 INTEGRATED COMPANIES
BARIUM
STEEL CORPORATION
WORKING IN STEEL, ALUMINUM, MAGNESIUM, FIBERGLASS

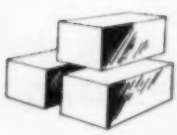
BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. • WILEY MANUFACTURING CO.



WRITE FOR BULULETIN 3295

More billets sheared per hour —

Easier inspection — Less Waste



Knives of "Buffalo" shears penetrate only 3/16" into forging stock, localizing a sharp vertical fracture which produces a clean, square end. Absence of "smears" enhances visual inspection for porosity, resulting in a better finished product. Speeds up to 30 cuts per minute are possible, with automatic hold-downs and feed tables. Up to 10" rounds and 9" squares can be handled, at six cuts per minute. For lower shearing costs, it will pay you to investigate "Buffalo" Billet Shears. A size to fit your operation.

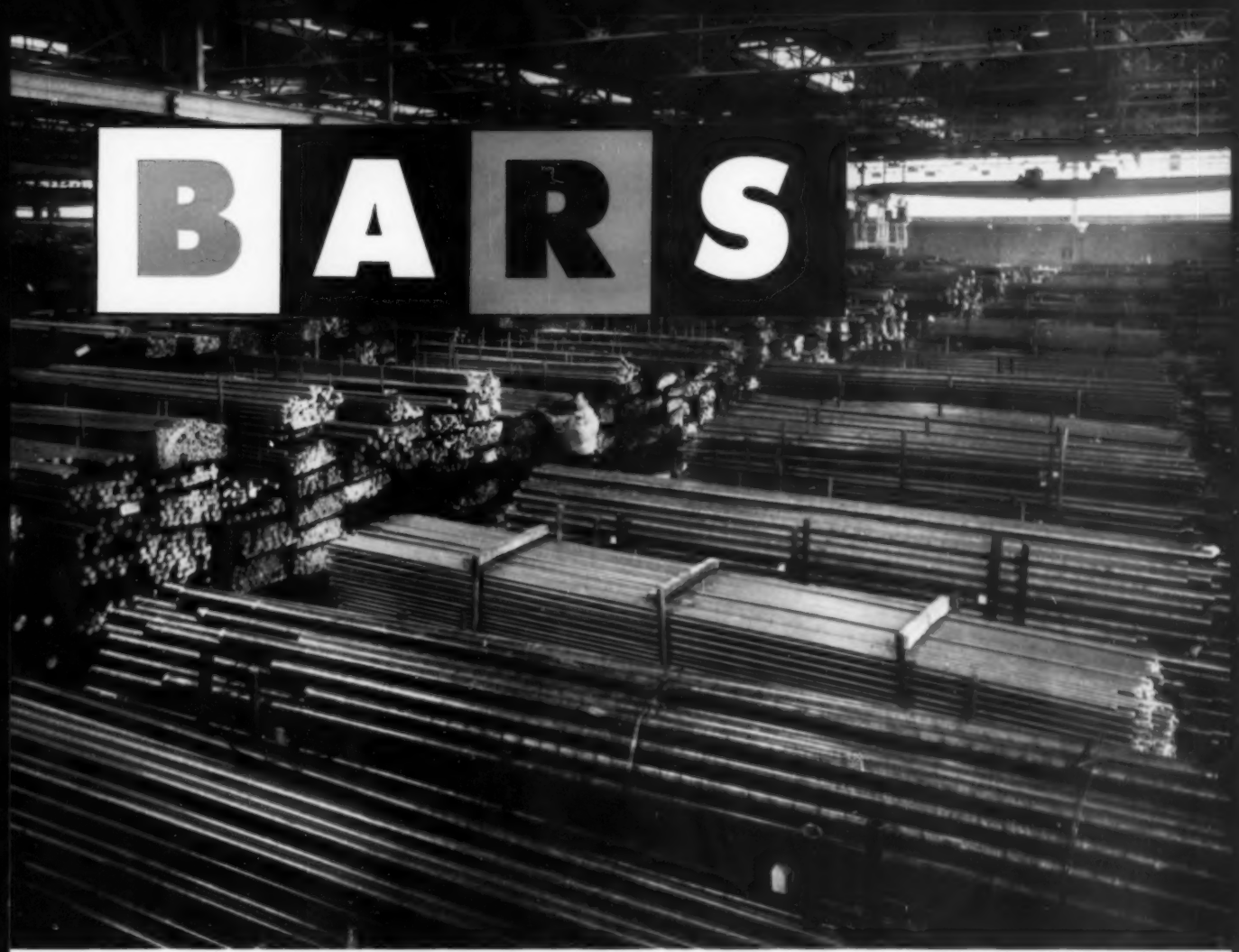
BUFFALO FORGE COMPANY

158 Mortimer St. Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" BILLET SHEARS

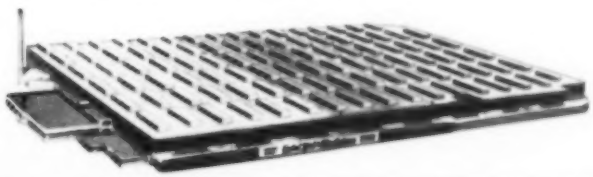
DRILLING PUNCHING SHEARING BENDING

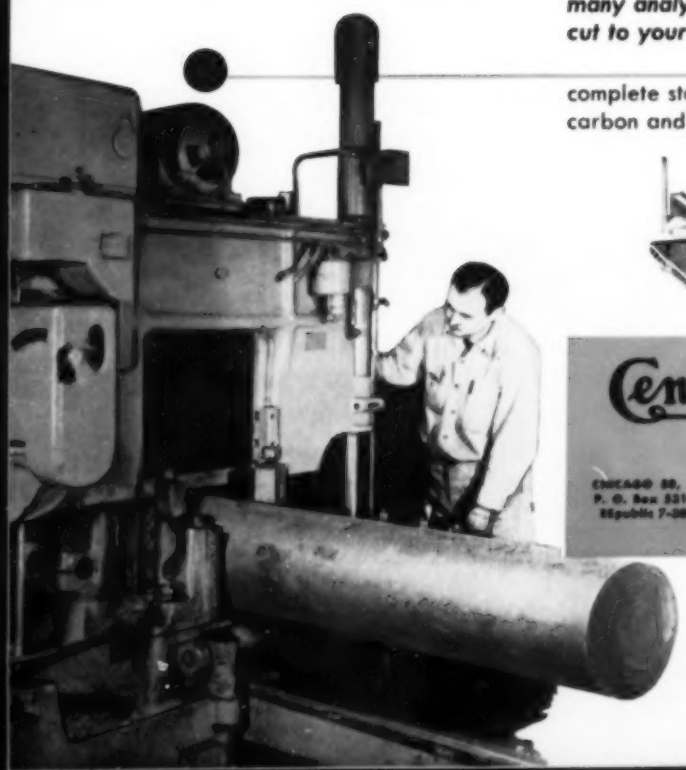


HOT ROLLED • COLD FINISHED

many analyses in a wide range of sizes
cut to your multiple lengths

complete stocks of hot rolled, cold finished, stainless steel
carbon and alloy, copper, brass, aluminum





Central Steel & Wire Company

PLANTS and OFFICES

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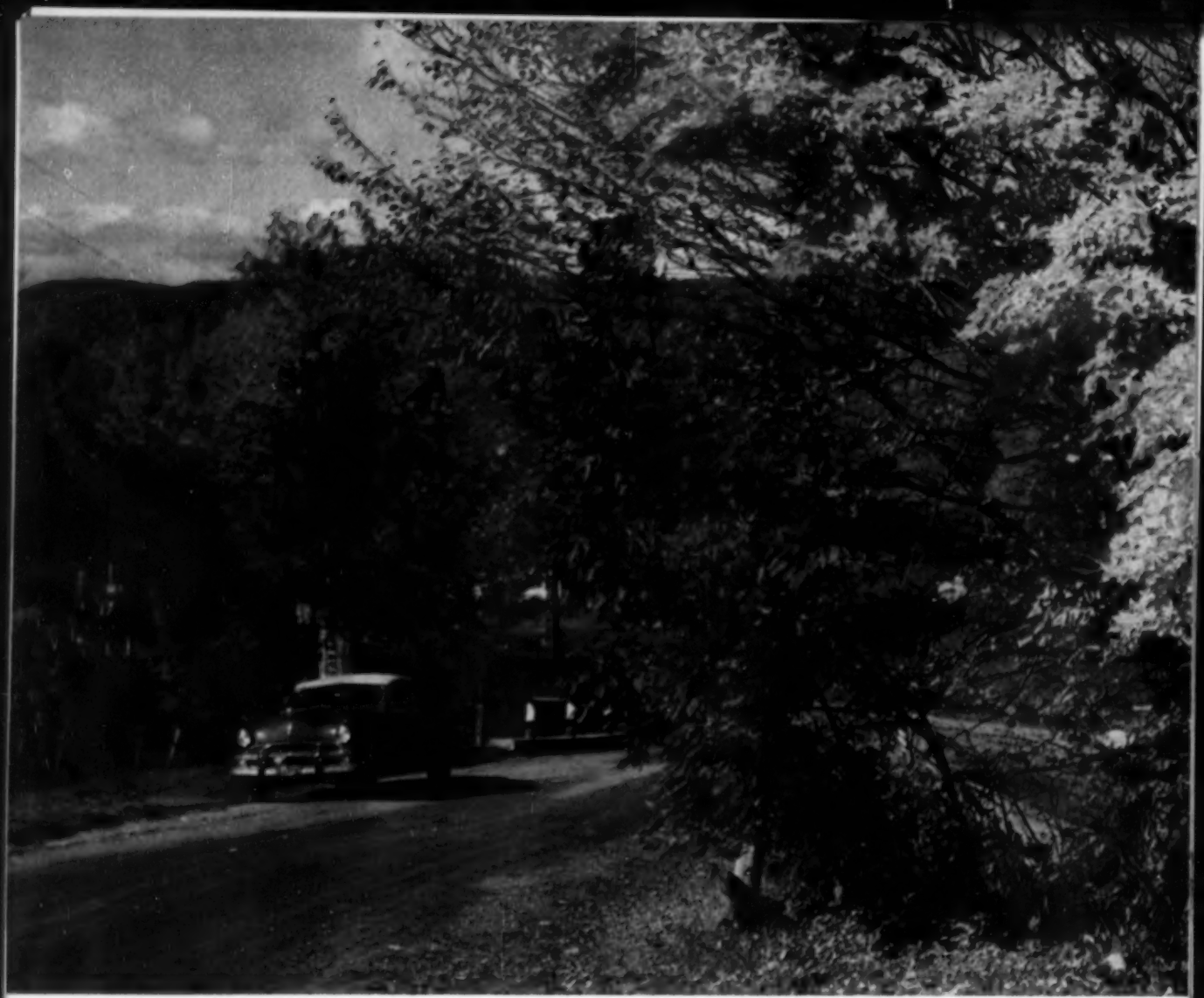
P. O. Box 5310-A
REpublic 7-2800

CINCINNATI 14, OHIO
Box 148 Annex Sta.
AVon 2220

DETROIT 12, MICH.
P. O. Box 148 Hamtramck Sta.
TWinbrook 3-2300

MILWAUKEE 1, WIS.
Box 1154
EVergreen 4-7400



Fall Foliage "The Color Line" FPG Photo

BULLARD

The Invisible Background of Industrial Progress

It is often said that the best things in life are free. Certainly the scenic joys provided by Mother Nature defy the greatest talents of man. Nothing is more awe-inspiring than a drive or trip over the highways and byways of our great land in the fall when Nature is in her fullest splendor. This is a privilege within the grasp of everyone.

Manufacturers of transportation equipment such as automobiles, busses and railroad locomotives and cars; and manufacturers of road-building equipment including trucks, bulldozers, road rollers, road scrapers and mechanical shovels have recognized that Bullard *Modern Machine Tools* are efficient manufacturing units — the ultimate in their field — another example of "The Invisible Background of Industrial Progress."

THE BULLARD COMPANY • BRIDGEPORT 2, CONNECTICUT

Bullard Contin-U-Matic

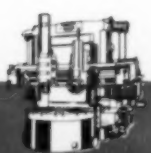
Type "RD" with 4–6 and
12 Spindles in 10"–14"–20"

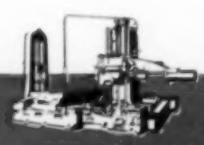
Do you need increased production? Do you want to lower your costs? Then investigate the advantages of a Bullard Contin-U-Matic.

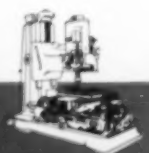
A case study of one of our customers reflects how a Bullard Contin-U-Matic provided the answer to their problem. Production on a reverse ring gear as previously machined was 38 pieces per hour. With a slight change in the holding fixture and tooling, the Contin-U-Matic method showed a great production increase over the former boring machine method. The customer is now machining 122 pieces per hour at 75% efficiency — *a productive increase of better than 220% over the previous type of equipment.*

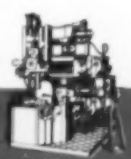
We invite you to avail yourself of Bullard Engineering Service by calling your local Bullard Sales Office or writing to The Bullard Company, Bridgeport 2, Connecticut — phone EDison 6-2511.

CONTIN-U-MATIC


CUT MASTER


HORIZONTAL BORING


SPACER

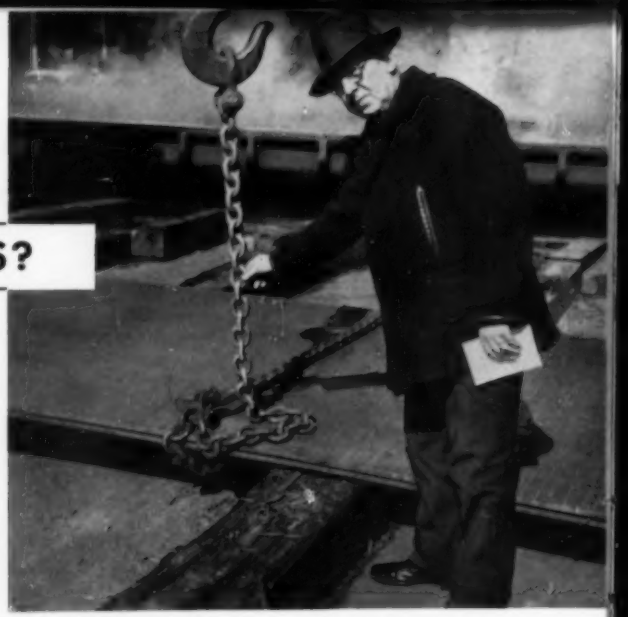

MAN-AU-TROL

MULTI-AU-MATIC

BULLARD

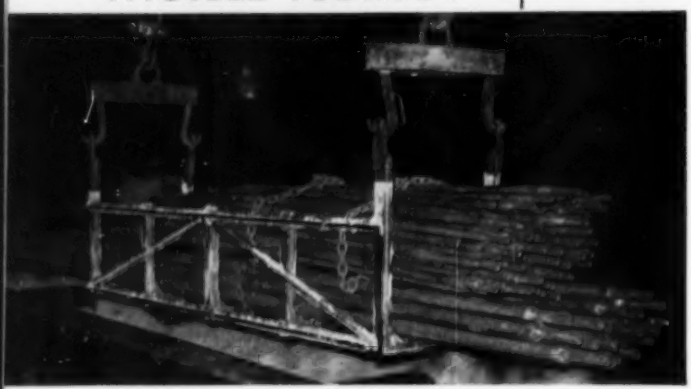
What do you pickle...

...SHIP PLATES?



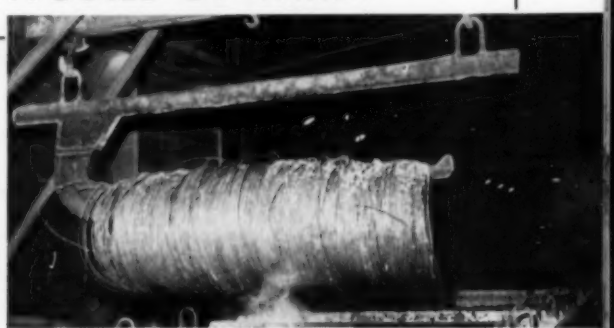
Chains still going strong . . . after 10 years. That's the record run up by this Monel chain and its partner in an East Coast yard. Chains of wrought Monel are ductile, too . . . provide greater safety. And they are weldable; can be reconditioned for extended service life.

...STEEL TUBING?



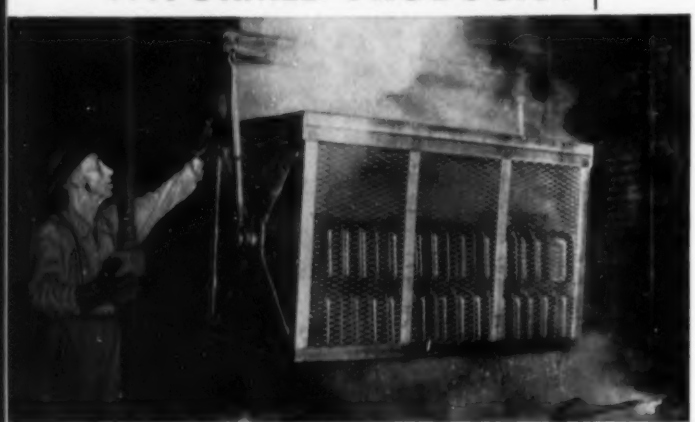
Look at the condition of this crate. It has served continuously since 1942, handling tons of tubing daily. Notice too, how thin the members. With Monel you can design for greater payloads. Monel has the strength and corrosion resistance needed.

...COILS OF WIRE?



Big payload on this Monel hook. It carries 3000 lbs. of wire per load into the 8%, 160°F. sulfuric bath. After 4 years, it and 36 others like it in this Ohio plant show no signs of corrosive attack . . . thanks to their Monel construction.

...FORMED PRODUCTS?



Monel gives this basket its light strong construction . . . gives it the acid resistance, the toughness to remain in nearly perfect condition after three years pickling hollow ware. Never a sign of copper flash, either. Monel's high nickel content makes it highly improbable.

...SOMETHING ELSE?

See for yourself how well Monel serves all these uses!

You can see that Monel has what you're looking for in a metal for pickling equipment and fixtures . . . the acid resistance, the strength, the toughness.

And it gives you complete freedom of design, too . . . minimum corrosion allowance, maximum workability and weldability.

So plan to use Monel for your equipment. And call on Inco's Technical Service Section for help in solving specific pickling problems.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO

Monel Pickling Equipment

STEEL
October 18, 1954

Metalworking Outlook

$250 Million for New Chrysler Lines

Chrysler Corp. has put $250 million into its 1955 line of cars which will start coming out Nov. 9. To assure a top speed sales start, even top officials are putting on their selling clothes to contact suppliers and other potential customers. With the new line, the company hopes to recapture 20 per cent of an estimated 5.3-million car market in 1955. Chrysler had some 20 per cent of the market in 1953 but sales this year have slimmed down to about the 13-per-cent mark. By next Jan. 1, the corporation expects to make a quarter-million of the '55 models. It spent $200 million on its last major restyling for 1953.

Ford Goes Continental

Ford Motor Co. will introduce a 1955 model where high volume won't be the objective. It's the long-rumored Continental, a continuation of the old Lincoln-Continental first built in 1940 but discontinued in 1948. Ford's Special Product Division, renamed the Continental Division, will design, engineer, manufacture and distribute the car under the direction of the youngest Ford brother, William Clay. A new plant in Ecorse Township, Mich., is under construction for the Continental's production. Packard with its Patrician, Cadillac with its Fleetwood, Chrysler with its Imperial and now Ford with its Continental will vie in the lucrative luxury market.

Banking on High Personal Income

Continuing high personal income is the factor automakers and other producers of consumer durables are banking on to take their 1955 goods—both in luxury and mass consuming classes. For the first eight months of 1954, personal income was at an annual rate of $285.2 billion, off only a shade from 1953's $285.5 billion. Now, with wages and salaries on the rise, look for income in this year's last quarter to better the same period last year.

Chicago Bails Out

Production in the Chicago area is just beginning to get back to normal after the heaviest rainfall there in 69 years. Flood-induced power shortages caused most stoppages in metalworking plants last week. Manufacturing was off as much as 50 per cent.

Sewage Equipment: Industrial Potential

Take a look at sewage equipment or components if you seek new markets. About $600 million a year is going into sewage treatment, but experts say three times that much should be spent for the next five years to ease the problem and provide for future population growth. H. R. Wallrath, manager of General Electric Co.'s contractor and construction industry sales,

Technical Outlook—p. 91 Market Outlook—p. 137

says the nation has an immediate need for 6700 new sewage plants and 3500 industrial waste facilities. In addition, many of our 6600 plants are inadequate and must be expanded.

Expanding Gas

And increased demands for natural gas will provide expanding markets for metalworking. American Gas Association says its industry will need 4.6 million tons of steel pipe from 1954 through 1957. Of that amount, 2.9 million tons will be 16 in. and over, primarily used for gas transmission lines. An additional 134,000 tons of steel in other forms and 446,000 tons of cast iron will be required by the industry in the 1954-1957 period.

Byers Tries Plastics

The 90-year-old A. M. Byers Co. is joining the youthful trend among metal pipe companies and will sell and distribute plastic pipe. The product will be made by an established manufacturer of plastics. The company, under its newly elected president, A. B. Drastrup, will also spend up to $2 million on new-type facilities for wrought iron pipe.

Coming: Transoceanic Television

Transoceanic television may shortly pass beyond the drawing board stage. Unitel Inc., a New York telecommunications and planning firm, envisages relay stations at 250-300 mile intervals crossing Newfoundland, Iceland, Greenland and then on to England and the continent. The plan is technically feasible, but the cost of building such an elaborate relay network is prohibitive now. National Planning Association believes that a more probable immediate development is television film exchange. The Voice of America already does that. Now that 32 nations on five continents have TV stations, exchange on a commercial basis is more likely.

Straws in the Wind

George Romney is new president and board chairman of American Motors Corp., succeeding the late George W. Mason . . . Bureau of the Census is readying 2.5 million report forms to be mailed early in 1955 for the 1954 Census of Business, Manufactures and Mineral Industries . . . Questionnaires will be sent to about 12,000 firms this month seeking information on their research and development activities as part of a National Science Foundation survey of industrial science.

This Week in Metalworking

Record highway construction widens metalworking markets (p. 49) . . . There's a slight—but only slight—upturn for railroads (p. 50) . . . Pitney-Bowes Inc. estimates it saves more than $118,000 a year by putting some of its office employees on incentive pay plans (p. 51) . . . Fringe benefits appeal to top management, too, and can help modernize your executive compensation program (p. 52) . . . Phoenix Mfg. Co. has installed a 20-in. merchant bar mill at Joliet, Ill. (p. 55) . . . How you can save on fleet auto expenses (p. 60).

Draw it!

Form it!

THE SPECIAL ZINC COATING ON THIS STEEL WON'T FLAKE

Try this drawing operation on ordinary galvanized steel and chances are the zinc will peel and flake under the strain, leaving bare spots for rust to attack.

With Armco ZINCGRIP it's a different story. This steel has a special zinc coating that stands up through any operation the steel can take. Draw it or form it—Armco ZINCGRIP won't lose its zinc coating.

Yet it costs no more than ordinary galvanized steel. Deep drawing extras are the same as for cold-rolled steel.

Armco ZINCGRIP now has a record of more than 18 years in proved service. It is the *original* sheet steel hot-dip coated on a continuous production line. This method of coating was patented by Armco in 1936. Experience gained by Armco technicians during that time assures you of the right kind of zinc-coated steel for your products.

Mail the coupon for the catalog on Armco ZINCGRIP. Find out how this special steel can cut your manufacturing costs and increase customer-satisfaction with your products.

Armco Steel Corporation
4264 Curtis Street, Middletown, Ohio

Send me a copy of the catalog on Armco ZINCGRIP

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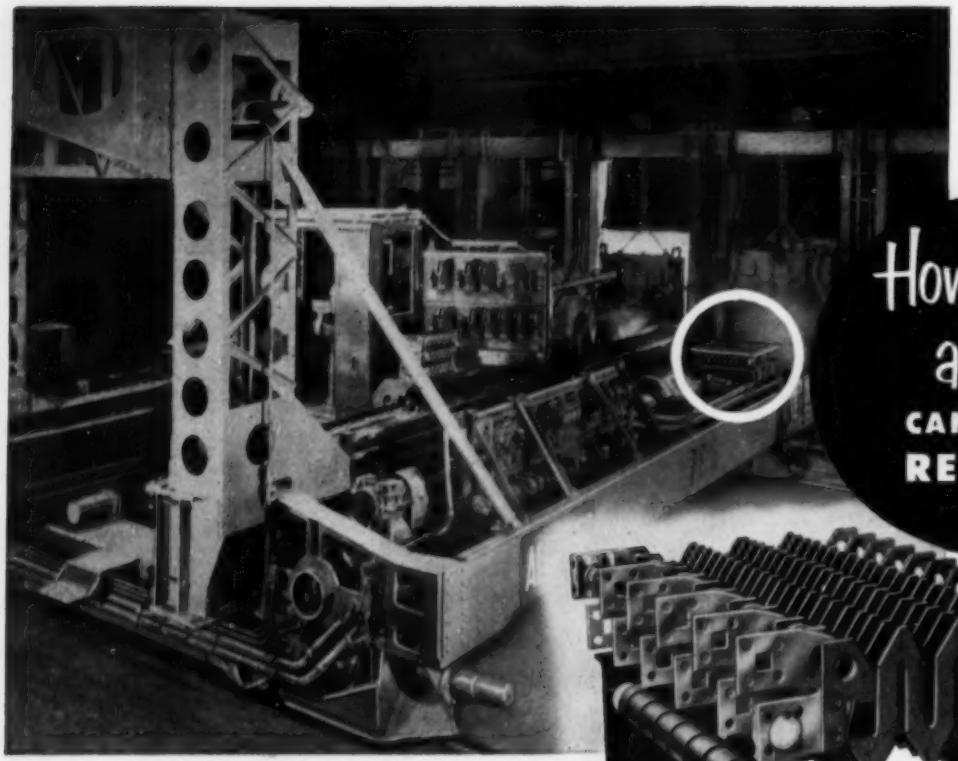
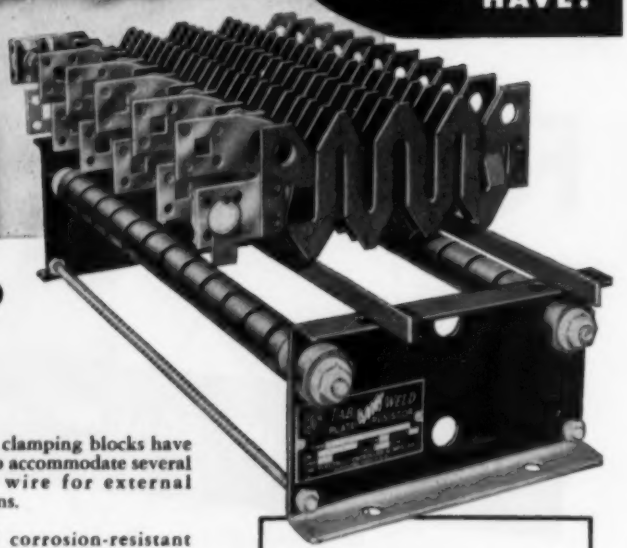
SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



How many advantages CAN A RESISTOR HAVE!

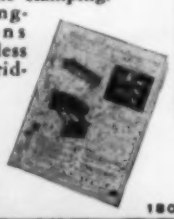


ONLY EC&M TAB-WELD PLATE RESISTORS HAVE ALL THESE FEATURES!

1. Spot-welding of resistor ends, offset to bring adjacent grid eyes into intimate contact, results in permanent current-carrying path throughout the section.
2. No burning at grid eyes.
3. No periodic tightening of clamping nuts.
4. Terminal plates welded to resistor tabs along one side of section. Small adjustments in resistance value easily effected because plates are closely spaced.
5. No burning at taps.
6. Negligible resistance change between cold and maximum working temperature.
7. Insulating spacers of high dielectric strength accurately molded to shape from noncarbonizing material which remains dimensionally stable.
8. Terminal clamping blocks have grooves to accommodate several sizes of wire for external connections.
9. Made of corrosion-resistant chromium alloy steel.
10. Nonbreakable.
11. Double insulation to ground.
12. All standard sections same length, width and height.
13. Standard mill sections built with same size resistors per section.
14. Separate nuts on supporting rods clamp grid-stack independently of end-frame clamping. Accurate mounting-hole dimensions maintained regardless of variation of grid-stack length.

SHUTDOWN AVOIDED! Recently in one installation, a swinging overhead-crane load bumped resistors on charging machine and smashed end-frames and broke several spacers of grid assembly. *Shutdown was avoided* because current-carrying path of EC&M TAB-WELD Resistors remained intact and permitted charging of furnaces to continue. Later when down-time was available, section was replaced and returned to repair shop for new spacers and end-frames. This is another example of the durability of EC&M TAB-WELD Resistors.

Write today for illustrated Bulletin No. 942-B.



1808

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Sturdy Economics

Farmers purchase many materials and products from industry. For this reason, most industrial executives make an effort to understand farmers' problems. In recent years, attempts to achieve this understanding have met with disconcerting rebuffs. Through deceptive political maneuvering, the original simple idea that the farmer buys and sells on identical terms has been blown up by bureaucratic processes into a complicated mess few can fathom.

In the Oct. 19 issue of *Look,* Fletcher Knebel presents a story of the alarming farm situation phrased in terms industrialists can understand. "Imagine," he says, "5,300,000 glistening automobiles standing idle and unsold on parking lots throughout the nation." Also imagine that Uncle Sam says to Detroit: "Turn out millions more of new cars." Detroit replies: "We can't sell the 5,300,000 we built last year. We'll go broke." Responds Uncle Sam: "Go ahead; we'll guarantee you a profit." Puzzled, Detroit asks: "Who'll pay for it?" Uncle Sam replies: "The taxpayer."

A year later 10,600,000 cars are stacked bumper to bumper on costly government-owned or leased parking lots. Congress toys with plans to build new storage space to sell Cadillacs, Lincolns and Chryslers at slashed prices to backward nations or even to the Soviets.

Industrialists can readily understand what this situation would mean if it were to occur in motordom. That it has actually occurred in agriculture should spur every metalworking executive to renew his efforts to help the Eisenhower administration go forward in its courageous attempt to restore realism to the farm program. Particularly, they should applaud Secretary of Agriculture Ezra Taft Benson for his heroic stand for reason and common sense against demagoguery and greed.

No automobile manufacturer, no machine tool builder, no fabricator or producer of any material or product at this time is entitled to an absolute guarantee that his output shall be bought and paid for at a price artificially supported by the government.

Farmers are unhappy in spite of the fabulous favors politicians have granted them. In the long run they would fare better if they were to depend more upon the true and tried laws of supply and demand.

E. C. Shaner

EDITOR-IN-CHIEF

PAY FOR EXECUTIVES: Since the turn of the century, there has been a steady transition from an almost complete management of industrial units by owners to a situation where the owners, in increasing majority, hire professional executives to manage their affairs.

This change has introduced many problems in connection with the proper compensation (p. 52)

of paid executives. Several decades ago when personal income taxes were moderate, a competent industrial executive could get along nicely on a stated salary, a share in profits over a certain figure and an occasional opportunity to buy stock in the company. Today, the problem of compensating executives fairly is complicated by many new factors. In many instances, it becomes necessary to offer top management men deferred-income inducements to compensate for the exorbitant slice the government takes from their current income.

This problem of proper compensation for those who run our industries is important. If solved intelligently, it will lead to more efficient management.

OUR BIG HIGHWAY JOB: Along with construction of buildings, the most dynamic project on the national scene is the necessity of creating adequate roadway, parking and other facilities for automotive vehicles. Attempts to translate highway needs into terms of benefits to the metalworking industry (p. 49) will fall short of the mark. To date, nobody has come even close to appreciating the true scope of the challenge of providing suitable highways.

Administration spokesmen have hinted that this job entails an expenditure of $100 billion over a 10-year period. This easily could prove to be a gross underestimate. Providing adequate facilities for our rapidly increasing number of cars, trucks and busses involves not only highway running space, parking space and repair and maintenance facilities. It also involves the almost complete rehabilitation of the downtown areas of big cities and drastic changes in the topography of smaller cities, towns and villages.

Highway rehabilitation is one of our most serious problems, and, at the same time, it provides a major opportunity to erase "surplus labor" areas.

WOULD STEER TO LEFT: During the last eight midterm elections, the party in power in Washington has lost an average of forty-odd seats in the House in seven of the elections and gained nine seats in the eighth. In the same period the party in power has lost an average of four Senate seats in midterm elections. In view of this record, it is not surprising that some people are speculating (p. 56) as to what may happen if the Democrats win majorities in House and Senate in the Nov. 2 elections.

The answer depends to a large extent upon the relative strengths of the leftish and rightish elements in the Democratic party. The leftish, socialistic-minded members would try hard to swing the government back to lavish spending, deficit financing and inflation. They would attempt to steer away from the middle of the road and toward the extreme left.

THERE IS WORK TO DO: How successful they would be in their attempts to torpedo the Eisenhower administration's work of the last 22 months would depend largely upon the attitude and strength of the antisocialists in both parties in both houses. It is quite possible that with leftish Democrats, Morse and others plunging madly toward the left, the opposition, consisting of the advocates of free enterprise in both parties, plus the support of the administration, might prove to be pretty effective.

At any rate, the cue to industry in the few remaining days of the campaign is to support vigorously candidates who have demonstrated their firm belief in the system that has made this nation great.

POTENTIAL PLUS: Composite industrial production moves steadily forward at a growth rate averaging 3.5 per cent a year, but an occasional industry flashes out in front and stays there. One to watch is the induction heating equipment industry. It has been growing at a long-term rate of 10 per cent a year, it zoomed ahead at a 20 per cent pace with impetus gathered from the Korean war and it should show 15 per-cent-a-year sales increases for years to come.

Automation and induction heating were made for each other. Induction is hardening gears, shafts and intricate parts right in the production line (p. 92). It is being used for quick annealing. New ideas for it are everywhere. One application puts induction coils on one station of an automatic screw machine: Parts go in as bar stock and come out fully machined and heat treated.

Induction heating equipment sales are about $20 million a year now; $50 million a year before 1960 looks altogether possible.

If your firm uses MACHINED parts that look anything like these COLD-FORMED parts...

We'll show you how to cut your costs 30% to 70%

9 out of 10 companies using small machined parts like these are wasting thousands of dollars per year!

We know! We've *proved* in plant after plant all over the country that parts cold-formed the Milford way cost 30% to 70% *less* than when made by machining or other methods . . . whether the quantity runs to a few thousands, or millions!

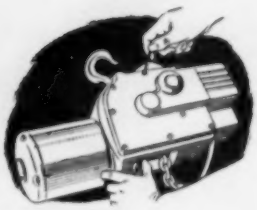
We'll *prove* that you can save 30% to 70% on *your* cost of small parts ***and our work won't cost you one red cent!*** Just tell us, ***"Yes, we use small machined parts that look like these."*** We'll take it from there! Contact your nearest Milford plant today!

THE MILFORD RIVET & MACHINE CO.

MILFORD CONN. | NORWALK CALIF. | ELYRIA OHIO | AURORA ILLINOIS | HATBORO PENNA.

23 UNBRAKO Socket Head Cap Screws are used to assemble this lightweight, high efficiency electric hoist. They were selected for their uniform accuracy and high tensile strength.

The knurling on the head of UNBRAKO Socket Head Cap Screws permits faster assembly, because of the positive slip-proof grip.



The uniform depth and size of the hex socket assure strength and maximum torque in wrenching—extremely important in the cap screws used to fasten assemblies like this.

UNBRAKOS—made of heat treated alloy steel—have fully formed threads, Class 3 fit; controlled fillet and continuous grain flow for strength. In standard sizes from # 4 to 1".

Save time and money by using UNBRAKO Standards...stocked by your distributor

You'll have less money tied up in inventory, you'll need less space for storage, you'll get personalized service and faster deliveries. And you'll be buying the finest socket screw products that modern machines, complete facilities and quality control can produce. Write for UNBRAKO Standards, a complete listing of socket screw products made by the world's largest producer. STANDARD PRESSED STEEL Co., Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION

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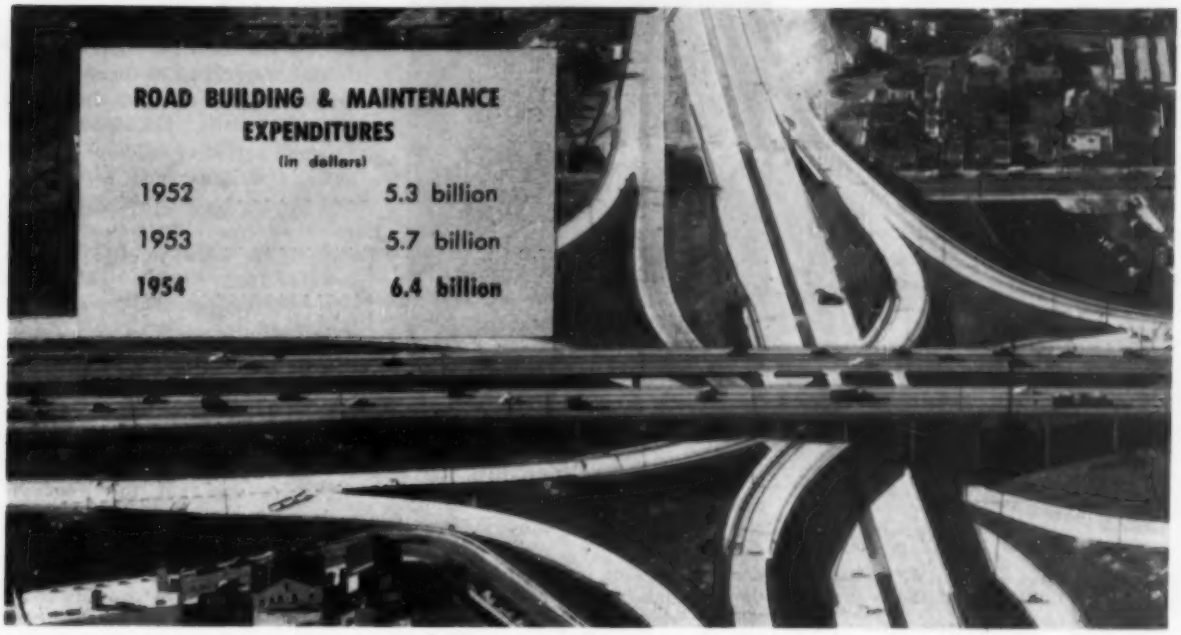


Metalworking Goes Places with Highway Construction

More steel is being used in today's road building. President Eisenhower's proposed 10-year program could double current highway expenditures

THE PRESIDENT'S proposed $50-billion highway program could pave the way for a hefty expansion of metalworking's construction markets.

It's estimated that nine cents out of every dollar spent in highway construction go for steel. Add to that the tremendous equipment investment necessary for road construction and metalworking's king-size share in road building comes into focus.

Current Pace—Road construction and maintenance are already clipping along at a record $6.4-billion pace (see chart). The proposed 10-year highway program would double the annual federal, state and municipal expenditures.

How much of President Eisenhower's recommended program Congress will buy in its next session is a question mark. But nobody will argue the need. The story is told in terms of growing traffic congestion and increasing accidents and deaths as today's 53 million cars operate on a road system built for approximately 35 million cars.

Footing The Bill—Chief question at the moment is how to finance the program. A special presidential advisory committee headed by Gen. Lucius Clay delved into several possibilities at hearings last week. It'll meet with the Governor's Conference in late November to work out an acceptable financing formula.

Bureau of Public Roads' figures indicate that metalworking's share of the road construction dollar is increasing. In a compilation of $953 million in highway construction a total of 800 million lb of steel was used. While this is slightly less than a pound of steel for each construction dollar, contractors report that steel use is nearing the pound-for-dollar ratio because of higher standards in modern highways—they're wider, must take heavier loads and are getting more complex. In construction of some of the larger city expressways which employ elevated systems, it's common to find 2 lb of steel wrapped up in each construction dollar.

The Uses—Most steel in highway construction goes into wire mesh, structurals and culvert pipe, although guard rail beams and cable, bridges and roadside fencing provide a big market.

The huge federal highway program would also provide new stimulus to earth-moving and other construction equipment industries. Contractors report that every dol-

lar's worth of construction requires 70 cents worth of equipment to do the job. Maintenance and replacement of equipment cost 10 to 12 cents of each construction dollar.

Impact—American Road Builder's Association figures point up the importance of the nation's highway network to the economy as well as to metalworking: Highway transportation in all its phases accounts for about one-eighth of the nation's gross national product.

Think Profit-Wise, AMA Told

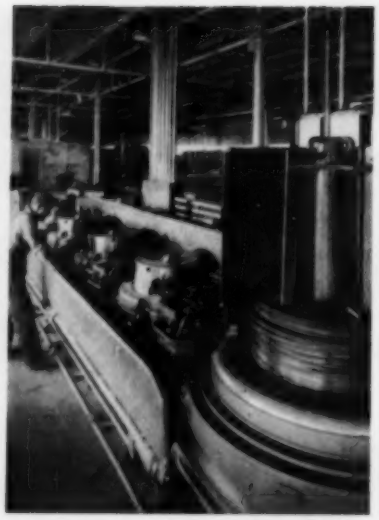
Production men should start thinking and talking in terms of the woods (profit) instead of the trees (cost reduction, greater output or more efficiency).

Too frequently in all phases of business "we get so involved in details of our job that it is easy to forget this profit thought," advises Boone Gross, president, Gillette Safety Razor Co.

Speaking to production executives at the American Management Association's fall manufacturing conference in New York last week, Mr. Gross pointed out: The chief difference between the president and other executives of a company is that the president thinks first of profit and his subordinates tend to think only of the means to attain it.

Urging production executives to be on the lookout for "profit sleepers," particularly in areas of quality and management development, Mr. Gross warned that it takes real skill in factory management to know just how and what quality improvements can be translated into increased profits. "You must be sure that the quality is one that counts and that your drive for quality doesn't splash over into nonprofitable expenditures."

A program of building a stronger executive or supervisory team is often completely overlooked or, worse, thought of in reverse, according to Mr. Gross. "How often do we fail to hire enough promising young men and train them for supervisory jobs simply because their salaries will temporarily increase indirect labor costs and may seem to cut into profits."



Steel Rod to Welding Rod

First step in manufacture of welding electrodes at Westinghouse Electric Corp.'s Montevallo, Ala., plant is drawing wire or hot-rolled steel rod through this series of dies. The "drawn wire" is automatically wound onto the metal "spider" prior to being straightened and cut into lengths

Uphill Climb for Railroads

Little increase in steel buying likely. Some rise in car orders may be ahead

STEEL BUYING by railroads in 1955 won't be much better than it has been this year. The main reason is that the railroad business is off considerably from previous years, and prospects for 1955 aren't enough better to justify much of a spurt in buying.

Inventory is a factor in a few cases. The New York Central, for example, cancelled a substantial portion of its 1954 tonnage and still has a good amount of rail on hand that probably won't be laid this year.

Inquiries Coming—Some increase in inquiries may be noted soon. Several railroads are still deciding on next year's requirements. But preliminary indications do not point to substantial gains over this year's purchases.

Freight car loadings have strengthened somewhat in recent weeks. It's encouraging, but "nothing to get excited about," said one railroad official. The rise will have to show obvious signs of continuing into second quarter, 1955, before it will have much effect on buying policies.

Buying Off—Shipments of standard rail for the first eight months of 1954 were 924,326 tons, reports American Iron & Steel Institute, compared with 1,198,498 tons in the same period of 1953.

The slump extends to freight car buying, too. Through August, orders were only little over half of what they were in the similar period of 1953.

Upturn Ahead — Some increase in car buying is in store. Still pending is the largest domestic inquiry, 1200 cars for the Reading. No action has been taken on 2500 cars being bought for India by the federal government.

Reports are that the Pennsylvania and also the Missouri Pacific are each contemplating purchase of 1000 freight cars. But inquiries are not before the market, and commercial car builders are inclined to think if these railroads do go ahead, the equipment will probably be built in the railroads' own shops.

Good Signs—The Pennsylvania had recalled more than 300 employees last week at Altoona, Pa., for a box car maintenance and repair program.

One large order for locomotives was recently awarded. Baldwin-Lima-Hamilton Corp., Eddystone, Pa., will build 50 steam locomotives for the General Services Administration for shipment to India.

Wean Builds Line for Reeves

Wean Engineering Co., Warren, O., will build a continuous hot-dip galvanizing line for Reeves Steel & Mfg. Co., Dover, O.

Part of a $3-million expansion program at the Dover plant, the line will be put into operation sometime next summer. It will produce all galvanized sheet used by Reeves for gutters, roof piping and other products, using strip from the Empire plant at Mansfield. Some galvanized sheet and coiled strip will also be made for sale.

New Beam Mill Gets Tax Aid

Fast tax write-off has been granted Inland Steel Corp. on a $14¾-million addition to its struc-

tural steel plant at Indiana Harbor, Ind. Half the cost will be written off over a five-year period.

The mill is scheduled to be completed about the end of 1955. It will make wide-flange structural beams in a full size range from 8 to 24 in. high. Annual capacity will be 325,000 tons.

Drum Makers' Appeal Rejected

The Federal Trade Commission is sticking to its policy of barring informal settlement of cases involving "suppression or restraint of competition through conspiracy or monopolistic practices." It turned down a request by U. S. Steel Corp. and four other steel drum manufacturers, charged with price-fixing, to settle by "gentlemen's agreement."

The companies contended there was no justification for the charge of conspiracy, that the law had not been deliberately violated. They asked to be allowed to negotiate an agreement with the complainants. The proposal was to voluntarily limit or discontinue the business methods that led to the charges. This, they said, would reduce the unnecessary expense and delay of going into court.

Office Workers Get Incentives

Pay incentives have been applied to certain office jobs with great success at Pitney-Bowes Inc. Despite the added costs, the company saves more than $118,000 annually

AUTOMATION in the factory, but behind it mountains of paperwork to be moved by thousands of office workers . . . such a vision inspired Pitney - Bowes Inc., Stamford, Conn., to extend incentive pay to many of its office workers.

Begun in 1948, the program saves the company $118,500 annually, after deducting the cost of installation, maintenance, timekeeping and incentive earnings.

What It Is and Isn't—Incentives, based on modern time study methods, are regularly applied to such clerical work as transcribing dictation, handling incoming and outgoing mail, preparing factory payrolls, computing salesmen's commissions, handling factory and traffic orders, posting and billing and taking periodic balances.

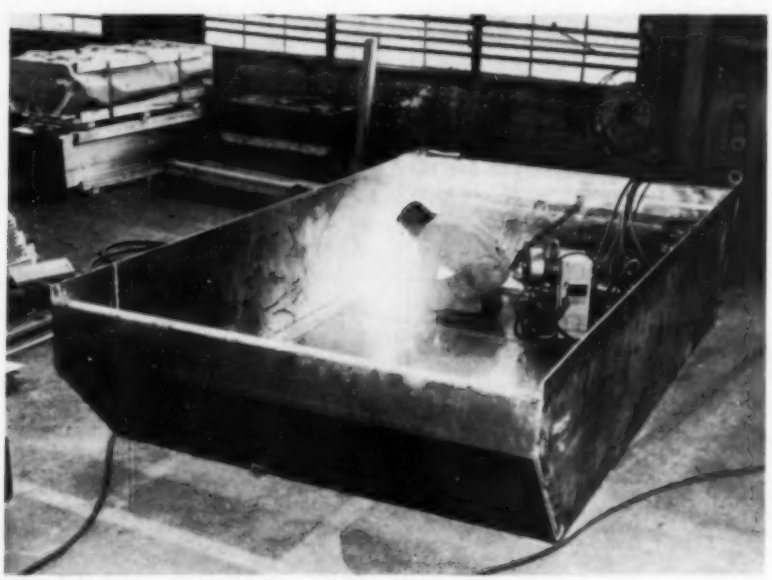
Not all office jobs have been put on incentive. But where they have, results have been gratifying.

Another Measurement—Over-all, 115 persons (one-fourth of P-B's home office employees) are on incentive rates. Productivity is often up as much as 40 per cent; average weekly earnings have increased 34 per cent, not including normal pay raises, in the five years the incentive plan has been in operation.

Said W. Gilbert Brooks, chief time study engineer for Pitney-Bowes, in explaining his company's program to the 3rd annual International Methods - Time - Measurement Conference: "Let me plug hard . . . for office incentives . . . a way to make available to white collar workers the same advantages the industrial worker has, namely, to increase earnings by increasing productivity and to have some fair and inspiring measurement of his individual worth on the job."

A Big Part—Mr. Brooks goes quickly on to say that incentives are only one phase of the office-work job facing management. Office methods must be improved; more mechanization must be applied to office paper work; and good sound human relations programs must be developed for the office worker.

Incentives are only a part of the solution, but they may be a big part.



Lightweight Barges for Shallow Waters

Using the new Alcoa IG electrode, a worker welds an all-aluminum barge of the type used at Aluminum Co. of America's Rockdale, Tex., works. The barges support pumps that remove water from cuts where fuel has been extracted for Alcoa's smelting operations. Consumable electrode procedures made it possible to assemble this flat surface design in aluminum with minimum distortion

Small Firms Can Shave Costs

Small firms may not be able to reduce office costs radically, but there are many opportunities to make small refinements and gains, according to a new leaflet put out by the Small Business Administration.

Called, "Streamlining Office Systems in Small Business," the leaflet explains in detail some suggestions for streamlining office operations under heads such as: Typewriters, Printing Calculators, Sorting Operations, Simplified Accounts Receivable Accounting and Small Payrolls. Copies are available from any Small Business Administration field office.

Trends in Executive Compensation

THROWING OVER a $100,000-a-year job as vice president of a large manufacturing company, a hard-driving executive recently took over the presidency of a small firm at half that salary. Why? He was given opportunity to share in the ownership of the firm, to share in the risks and rewards of his contribution to profit and growth. It meant more money and satisfaction to him in the long run.

Top management is learning, often the hard way, that it's as important to know *how* to pay executives as it is to know *how much* to pay them. Salaries alone don't supply infallible incentives that satisfy executives or keep them productive. Giving key men a direct stake in company progress has become a valuable means of adding the spirit of the entrepreneur to the corporate structure. Incentive compensation can attract, hold, stimulate and reward those men responsible for your company's business success.

On the Fringe—The U. S. Chamber of Commerce estimates fringe benefits take up 18.7 per cent of industry's payroll. Amount going to executives as incentives can only be estimated, but probably an executive earns nearly $25 for the company for every $1 of compensation received.

The influence these "fringes" exert on total compensation is indicated in a recent survey of almost 15,000 executives in over 1800 companies. It showed that bonus payments were equal to 43.6 per cent of salaries paid and retirement contributions were equal to 13 per cent of salary. About 45 per cent of U. S. commercial and industrial firms now make use of incentive compensation for their executives.

Big or Small — "Principles of compensation apply to small companies in the same manner as to big ones, except for the dollars involved," says D. H. Rosensteel, director of American Management Association's Executive Compensation Service. In closely held companies the difficult and expensive problem of stock evaluation can often crop up though.

Pay of top management as a rule is closely related to company profit performance, while middle management compensation depends more on departmental scale of operation. Administrative and technical employees tend to receive similar pay for similar qualifications regardless of their industry, location or company size.

Four general classes of incentive compensation plans are in use today; by far the greatest number allocate awards to individuals on

How Incentive Payments Vary by Industry

INDUSTRY	PER CENT OF SALARY
Wholesale and Retail Trade	60
Construction	53
Durable Goods Manufacturers	45
Nondurable Goods Manufacturers	40
Petroleum, Coal Mining	33
Financial Institutions	15
Utilities	9

Source: American Management Association

a discretionary rather than a fixed basis.

1. Informal plans in which both the fund and individual awards are discretionary.

2. Fund plans where the fund is based on a formula, but allocation of awards is based on appraised performance and the contribution of each participant.

3. Fund plans where both the fund and individual award are predetermined, and allocations are generally based on salary of each participant or group.

4. Plans without established funds where allocation of awards is based on predetermined formulas for each participant or group and is directly related to company profits.

Taxes Control — Most common type of additional compensation is the pension plan. Company contributions to retirement funds have increased steadily. Cash bonus and profit-sharing systems have gained popularity in recent years, and to a lesser extent, deferred payment arrangements. Fastest growth of all has come in stock bonus, stock purchase and stock option plans. Such impetus was given to stock option plans by a 1950 tax law change that 25 per cent of all companies listed on the New York Stock Exchange have put them in since that time, though they've lost momentum in the past year.

"Policies, personnel and training plans must be right to make incentive compensation work," says E. S. Ronk, of Stewart, Dougall & Associates Inc. "They must mean something in light of the organization's abilities, strengths and weaknesses. Some companies have lost control of them by adjusting long-standing compensation plans until they are unworkable."

Performance the Key—Because profit is the basic objective of business enterprises, it is vital that executive rewards be directly related to the individual's contribution to short and long-term profit. With emphasis on performance, the risk-taker and builder is paid for being right and conservative or poor judgment penalized.

Incentives must stimulate performance. In one company a division manager maintained business despite panic price competition and loss of sizable de-

EXECUTIVE COMPENSATION in a nutshell

BASE SALARY —A fixed sum for normal performance of duties . . . salary should be considered a value attached to a specific position rather than to an individual. It should rank all positions in order of importance, put a monetary value on each, provide for a range to reward continuous improvement and create confidence in fairness of pay for services performed.

BONUS—Compensation for individual accomplishments beyond normal performance . . . the bonus is determined by formula or discretion of top management. It can be paid in cash or stock and can be deferred. Bonus plans allow a company to cut fixed expenses by paying salaries close to the market level, yet directly reward performance. Drawbacks: Much bonus money goes for taxes, and some plans create the temptation to act with the bonus in mind at the expense of long-term company objectives. The amount of bonus is becoming increasingly subject to formulas based on profit. Incentive is weakened by paying them: 1. So frequently they become regarded as part of salary. 2. If used to correct inequities in salary. 3. If paid solely on the basis of salary.

PROFIT SHARING —A variation of bonus directly related to company earnings . . . can be applied upon retirement of the executive with possibility of favorable tax treatment. Profit sharing trust can't discriminate in coverage and must be paid in relation to salary. Because it uses salary as a basis for distribution and men who don't pull their weight share in proceeds, incentive value is diluted.

PENSION—The most common form of extra compensation . . . it must cover a broad segment of company employees. Its appeal is security. A danger lies in setting up a special plan for top executives: If the man has unrestricted right to the pension, company contributions to the fund may be taxed as his income. If restricted, the company may not be able to deduct its contributions as expenses in figuring its taxes.

DEFERRED PAYMENTS —For well-paid men nearing retirement . . . this plan is an attractive addition to retirement income. Usually requires a contract for services on a part-time or consulting basis. Of little incentive value to younger middle-management men.

STOCK PURCHASE —A right extended to key men to buy company stock . . . at a specified price (usually 95 per cent of market price or more) over a set period of time. Long-term installment buying can cause headaches if the market price drops below purchase price. Clauses limiting liability and allowing cancellation can mean tax troubles.

STOCK OPTION —A contract to buy a specified number of shares at a given price or prices within a stated period of time . . . because it offers opportunity for sizable long-term capital gains to be realized, the stock option provides real incentive to key men to help the company increase earnings and net worth. A National Industrial Conference Board survey indicates that 4 to 5 per cent of shares outstanding is total amount most often allocated executives. Most option privileges run five years, ten is maximum under law—beyond this point options are taxable as regular income. Shouldn't be extended down too far in the organization or freeloaders will rush in—it must go to the men who make it work. Plan can backfire if stock price drops for external reasons.

STOCK WARRANT —Akin to stock option . . . except rights to buy are transferable by the executive, and he may make a profit without actually buying and reselling the stock itself. Profits are taxable as capital gains. Warrants often involve less capital risk for the buyer but lack flexibility in timing of purchase. Also depends on rising stock price for success.

LIFE INSURANCE—Company-paid insurance policies . . . the executive or his family is beneficiary. If either receive unrestricted benefits of a policy, premium payments are taxable as income. With some types of policy, limited sums can be paid upon death of the employee without taxation.

INDIRECT COMPENSATION—Tangibles and intangibles other than money . . . can provide incentive. The man's feeling about his relative position in the executive pattern of the company often means more than money. These fringe benefits include job and company prestige, attractive offices and favorable working conditions, fair expense allowances, club memberships, travel facilities, vacation plans, rental of company-owned homes, educational benefits, low-interest loans, group life insurance and hospitalization plans. They can be of great importance in creating job satisfaction.

fense volume. Another division manager held his own but the competition increased profits 30 per cent—actually a below-par job. Yet each got identical bonuses. Such reward of incompetence undermines incentive values.

"Promotion is far more important than generally recognized as an incentive to middle management," says McKinsey & Co.'s Arch Patton. He illustrates with a company that underpays middle management and overpays top management, compared to industry norms. Because a key company objective was rapid expansion, enormous opportunity for upgrading at all management levels provided the incentive to middle echelons. "Replacing compensation with promotion as an incentive is not practical for the average company though," warns Mr. Patton. "It requires an unusually strong growth factor to provide enough new jobs to offer unusual promotion opportunity."

Demoting those who fail to measure up can also be an incentive, if the company recognizes that promotional mistakes are often the fault of the company and not the man. This system avoids two of industry's most popular solutions —the "up or out" theory of firing a man who can't handle his job, and the "build strength around him" idea of offsetting a man's weaknesses by adding strength in his area of responsibility.

How To Do It—Six steps to blueprinting a general compensation plan are suggested by J. C. Olson, of Booz, Allen & Hamilton. Company organization, ownership, competitive position and executive quality determine the specifics. 1. Define the objective of the plan. 2. Determine if the system is to be tailored for specific individuals, set up for a group of executive positions or designed for a combination of these purposes. 3. Translate objectives into specific tools, blending those fitting the company and the individual executives. 4. Judge the co-ordination and quality of the organization framework. 5. Check the base salary structure to make sure the foundation for extra compensation is sound. 6. Consider what extra compensation is needed.

Foundrymen Stress Employee Relations

At their Chicago meeting they were in fair agreement on business outlook: Gradually improving though highly competitive. Employee relations in coming period got a lot of attention

FOUNDRY BUSINESS will be good but competitive over the next five years.

That was the consensus of speakers and delegates at the National Foundry Association's 56th annual meeting in Chicago, Oct. 7-8.

What's More — One speaker, George W. Cannon, president, G. W. Cannon Co., Muskegon, Mich., also foresees much technical progress in foundries over the period. Production methods will improve through more mechanization; some automation will come into production methods and the design of buildings will be made around equipment to get economical material and product flow.

W. W. C. BALL
. . . heads NFA in '55

Good planning and production control, incentives for management and employees, sound cost accounting and sensible budgeting will be needed.

Rosy Glow—This outlook is all the more optimistic when placed against the background of remarks by Dr. Leo Wolman, director, National Bureau of Economic Research. Dr. Wolman told the meeting of foundrymen that the 1953-54 recession was not as bad as that of 1948-49. Bottom of the current decline was reached last summer, and business will increase gradually from now on, he added.

In fair agreement about the business outlook, foundrymen turned more attention on the problems of management-employee relations for the competitive period ahead. Consensus in this field was that it was much better to maintain positive relations with employees than wait for emergency situations to arise before taking action.

Medium — Speaking of policies for a medium-sized foundry, R. R. Washburn, vice president, Plainville Casting Co., Plainville, Conn., said employees should be told about current business conditions and their effect on bargaining for contracts. Mr. Washburn also said men should never be laid off as the result of new equipment or process installation. They should be transferred. Finally any new installation should be discussed with each employee, so that he will know its effect on him and the plant operation.

Small — Robert Langsenkamp, president, Langsenkamp - Wheeler Brass Works Inc., Indianapolis, speaking for the small foundry, stressed the advantages of person-to-person contact in management-employee relations.

Large — Large foundries were represented by Charles R. Appel, personnel director, U. S. Pipe & Foundry Co., Chattanooga, Tenn. He emphasized the importance of setting company policy before bargaining and sticking to it. All conditions and agreements should be written into the contract, he added.

R. J. Redmond, secretary, Buckeye Foundry Co., Cincinnati, spoke of advantages achieved by local foundries banding together to negotiate with unions. Absolute fairness in dealings is a must, said Mr. Redmond, as is the keeping of records of all union-management discussions.

Officers — NFA officers elected

for this year are: President, W. W. C. Ball, Taylor & Fenn Co., Hartford, Conn.; vice president, Paul L. Arnold, U. S. Pipe & Foundry Co., Chattanooga, Tenn.; treasurer, Frank J. Sherwin, Chicago Hardware Foundry Co., North Chicago, Ill. Charles T. Sheehan continues as executive secretary.

Big Future Seen for Titanium

Where does titanium fit into the metalworking picture of tomorrow? Two Republic Steel Corp. engineers, Thomas E. Perry and Robert J. Garmy, make this prediction:

"Titanium offers designers better ways of doing jobs where other available construction materials have failed," they reported in a paper before the Association of Iron & Steel Engineers. "It permits new designs that have been impractical due to material limitations."

In the military market, they cited such diversified uses as aircraft, armor plate and recoilless rifle barrels.

Analyzing nonmilitary uses, they said: "Titanium's excellent corrosion resistance and light weight make it valuable for use in food processing lines, chemical plant equipment, orthopedic devices and anodizing racks."

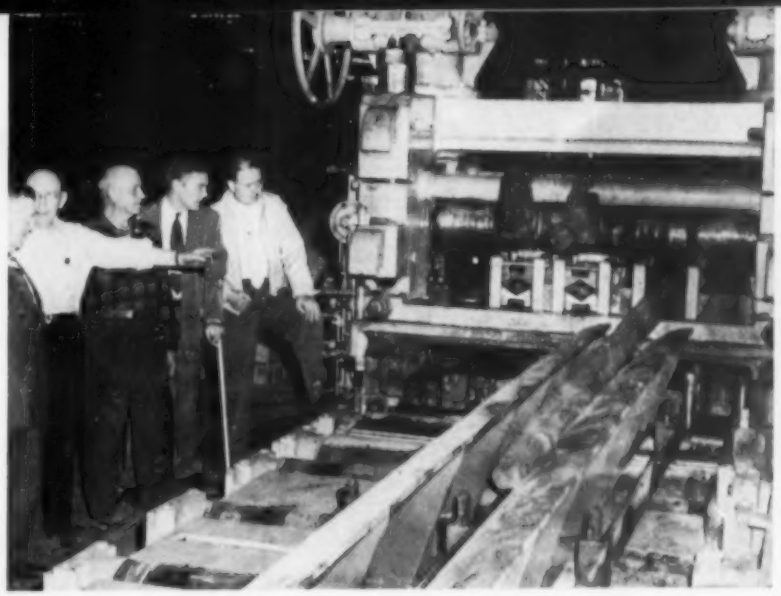
The authors observed that titanium has come a long way in six years. It took magnesium 20 years to reach the same level of development; aluminum, 25 years.

It's Getting Safer To Work

The nation's work injury frequency rate for manufacturing hit an all-time low in 1953.

Final figures of the Department of Labor indicate that the over-all manufacturing rate fell from 14.3—the previous record—to 13.4 disabling injuries per million man hours worked in 1953. First half figures indicate that the improvement is continuing this year.

Of the various manufacturing industries, lumber and wood products had the worst record with a 43.6 over-all figure. The report quotes primary metals at 14.1, fabricated metal products at 17.8 and machinery (except electrical) at 13.4.



Midwestern bar capacity up 135,000 tons as . . .

Joliet Mill Starts To Roll

INSTALLATION of a new 20-in. merchant bar mill at the Phoenix Mfg. Co.'s Joliet, Ill., plant marks the completion of a three-year expansion of Midwest facilities. A warehouse opened in the same city about a year ago will handle output.

The mill increases the company's capacity for billet and axle steel bars and special shapes from 15,000 to 150,000 net tons a year. The 20-in. three-high breakdown mill feeds four stands of 12-in. two-high and two stands of 10-in. two-high crosscountry finishing mills.

Product Flexibility — Phoenix now can produce bars and special sections ranging from $\frac{3}{8}$ in. through $2\frac{1}{2}$ in., compared with the former range of $\frac{3}{4}$ in. to $1\frac{1}{4}$ in.

Robert Peterson Sr., steel mill consultant, Cleveland Heights, O., engineered the new facilities.

The 20-in. three-high mill and pinion stand were fabricated from welded steel plate by the company's subsidiary, Graver Tank & Mfg. Co., East Chicago, Ind. Both live and tilting tables serving the breakdown mill and all runout tables were supplied by E. W. Bliss Co., Canton, O.

Equipment — Repeaters, reversing units, double-rotary flying shear, hot bed, back shear table and bar shear were built by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa. Repeaters are built for double stranding to increase production efficiency. Treadwell Engineering Co., Easton, Pa., constructed the 12-in. and 10-in. finishing stands.

A new heating furnace, supplied by Flinn & Dreffein Engineering Co., Chicago, will heat 30 tons of billets or axles an hour to 3000° F. It has a 17 x 50-ft hearth and is of pusher type with end charge and side discharge. Gas is the principal fuel, with fuel oil as standby.

Illustration shows officers and employees of Phoenix Mfg. Co. witnessing the first steel entering the breakdown stand of the new 20-in. merchant bar mill. Left to right are E. N. Gosselin, president; Henry Krause, mill superintendent; Luke Benedict, a veteran employee; Jack Gosselin, vice president and Walter E. Johnson, works manager.

By E. C. KREUTZBERG *Washington Editor*

NEA

Republican National Chairman Leonard Hall's remark, "It'll take more than speeches by the President to elect a Republican Congress," carries a warning to businessmen . . .

Electing a Congress Friendly To Business Requires Some Effort on Business' Part

BUSINESSMEN have a responsibility to see that history doesn't repeat itself this year.

That warning by Leonard W. Hall before a National Press Club luncheon recalls 1948 when public opinion pollsters said it would be Dewey in a breeze over Truman. A lot of Republicans, including many businessmen, figured the election was on ice and didn't bother to go to the polls.

What You Got—Truman was elected by a comfortable majority. And the nation, again including businessmen, got 25 per cent inflation of wholesale prices in the months following the Korean invasion and a one-sided, dishonest intervention in the steel strike.

Should Republicans find something else to do on election day this year and allow the leading posts in the next Congress to become occupied by Democrats, they should not be surprised at the consequences.

Evidence shows the Democratic party is promising voters a revival of the New Deal and Fair Deal objectives in an over-all platform with main planks that are definitely antibusiness in character (see STEEL, Oct. 4, p. 58).

The Issues: Atomic Energy . . .

There's certainly going to be a big fight when the Atomic Energy Act comes up for further revision in 1955. Democrats, through the Senate filibuster this year, won their basic fight for an expansion in public power, but they still have to get the necessary funds for the expansion. Also, atomic patents are up for "fair and full" study in 1955. Democrats this year succeeded in getting compulsory licensing of patents for 5 years.

The Issues: Taft-Hartley . . .

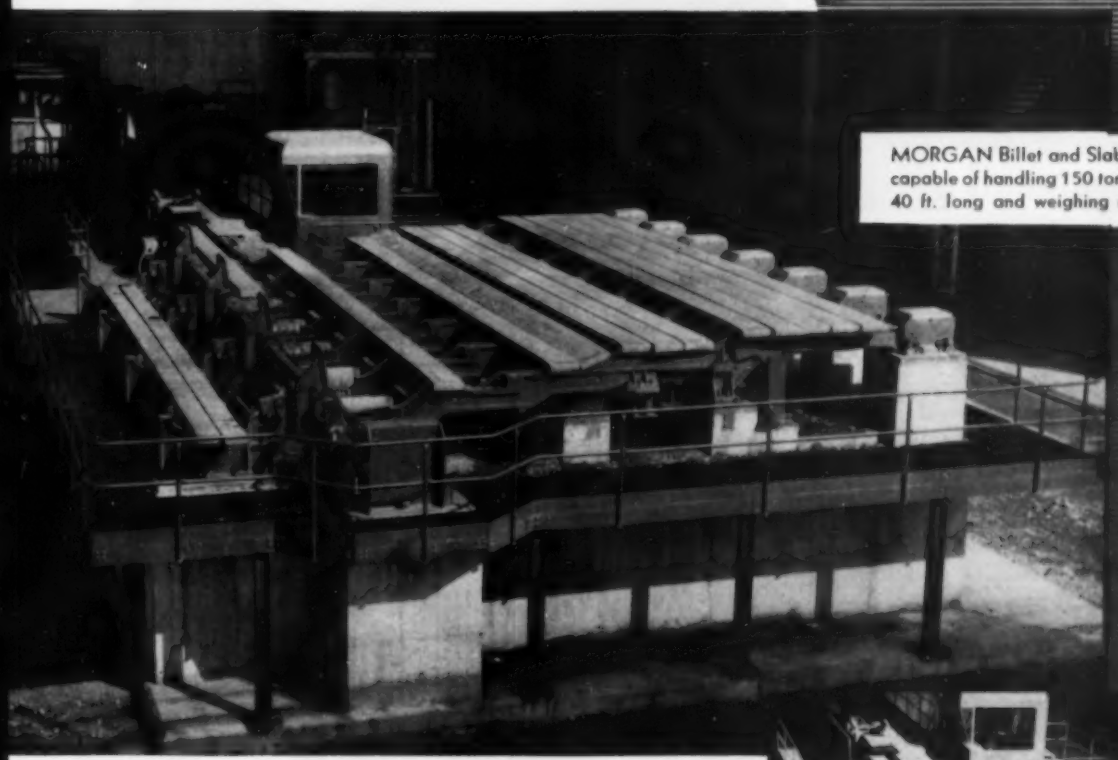
President Eisenhower has given assurance that he again is going to ask Congress next year to liberalize the Taft-Hartley Act. But once this issue gets to Congress there is no telling what will happen. A Democratic victory would be a victory for Big Labor; the lid might be blown off and T-H repealed outright.

The Issues: Taxes . . .

Another field in which there is sure to be legislation is taxes. The country simply cannot afford the loss of Treasury income of $3 billion a year that would follow corporate tax rate declines—from 52 to 47 per cent next Apr. 1, as scheduled, and from excise tax cuts scheduled for the same date. Those reductions would raise the estimated federal deficit for fiscal 1956 to as much as $8 billion.

Then there's the part of President Eisenhower's tax revision program that wasn't acted on in 1954. Pending proposals are vital to business. They include: Drafting of clear-cut rules covering pension, profit-sharing and stock-bonus plans; liberalizing tax treatment of foreign income; eliminating penalty taxes on intercorporate dividends and consolidated tax returns; reducing the rate and length of the holding period applying to capital gains tax and liberalizing tax treatment of retirement income for individuals not covered by pensions.

As a businessman, you have a large stake in the outcome of the 1954 elections. Safest program: Expect the worst and do everything you can to offset it. In particular, do everything possible to get out voters who favor a friendly and understanding government attitude toward business.



MORGAN Billet and Slab Separating Skids capable of handling 150 tons per hour of slabs 40 ft. long and weighing over 4 tons each.

MORGAN

$LAB SEPARATING SKIDS SAVE

IN FOUR WAYS . . .

Safety of operation. Eliminating hazardous backbreaking manhandling of heavy slabs and billets.

Sureness of function. Positively unpiling and aligning heavy slabs for controlled placement on a furnace charging table with selective turnover or discard under the eyes of the operator at the control desk.

Simplicity of design. Giving long years of trouble-free service.

Savings of operating costs. Doing with ease the work of several men; assuring an uninterrupted flow of steel to the mill.

RSM-42

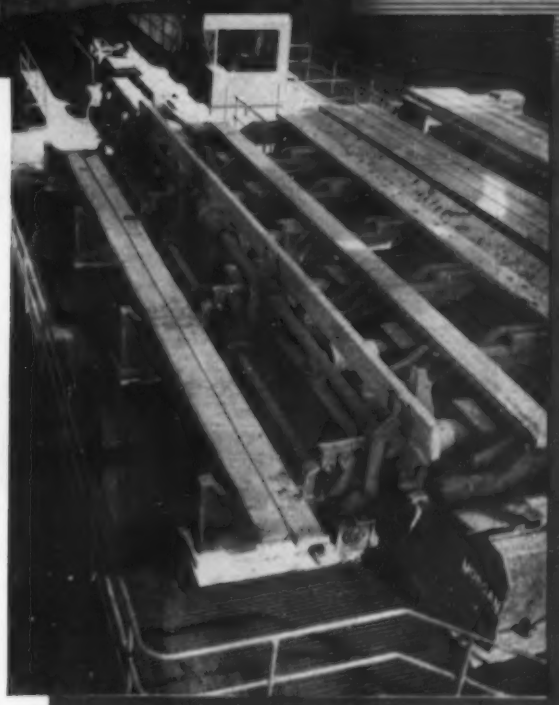


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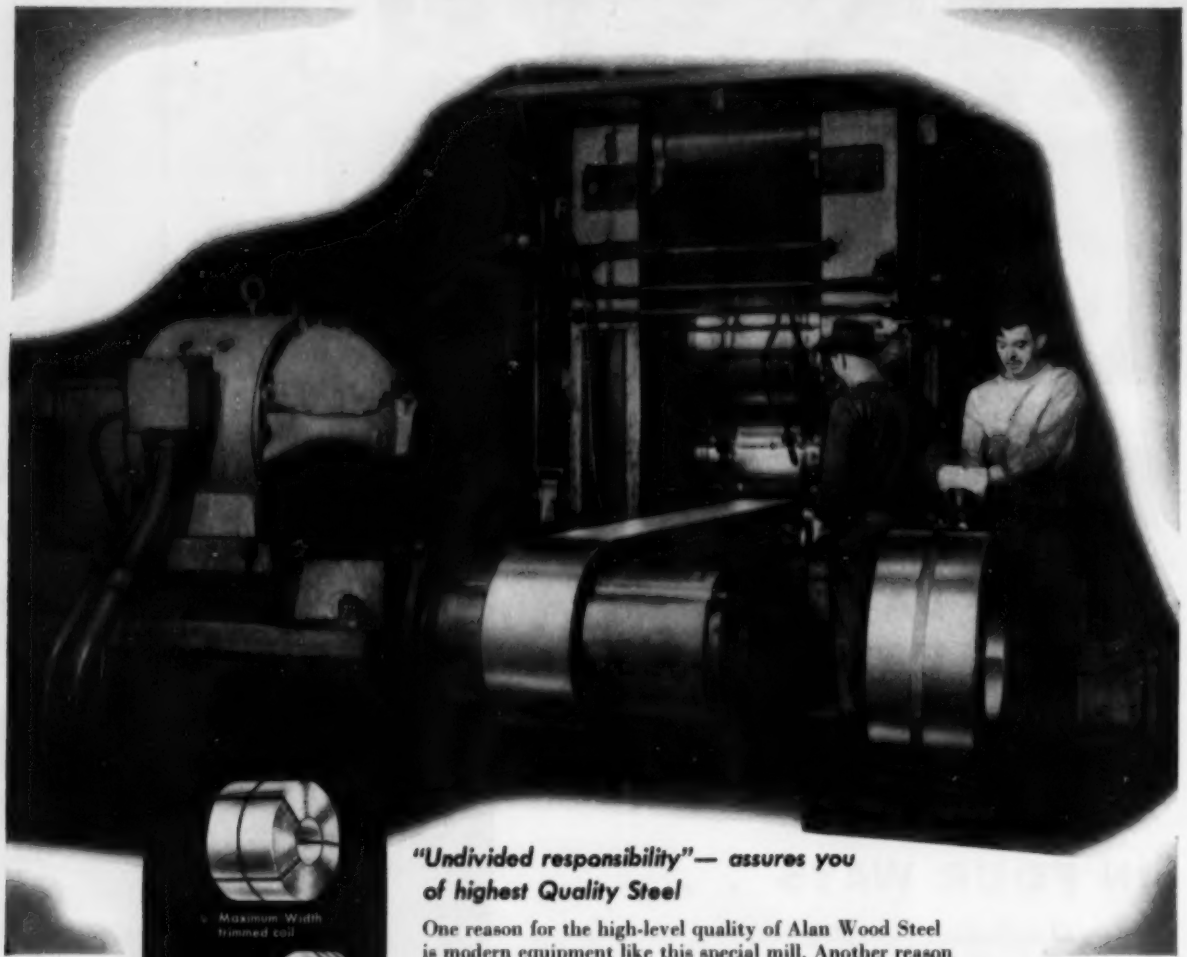
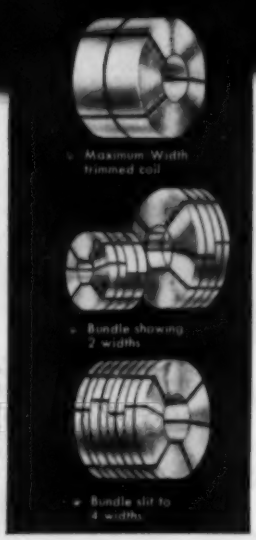
PLATE • SHEET • STRIP—*available in hot rolled quality*





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One reason for the high-level quality of Alan Wood Steel is modern equipment like this special mill. Another reason is our policy of undivided mine-to-mill responsibility, and rigid metallurgical control that guarantees your getting the finest quality steel possible to produce . . . and getting *exactly* what you want. Coils are finished with either mill edge or slit edge in widths up to 25½ inches, in thicknesses up to .1875 inches. Coils can also be slit to any desired widths from minimum width 1 inch to maximum width 25½ inches.

Our plant location at the center of Eastern industry and transportation also makes possible faster delivery at favorable freight rates.

More than a century and a quarter of iron and steel making experience

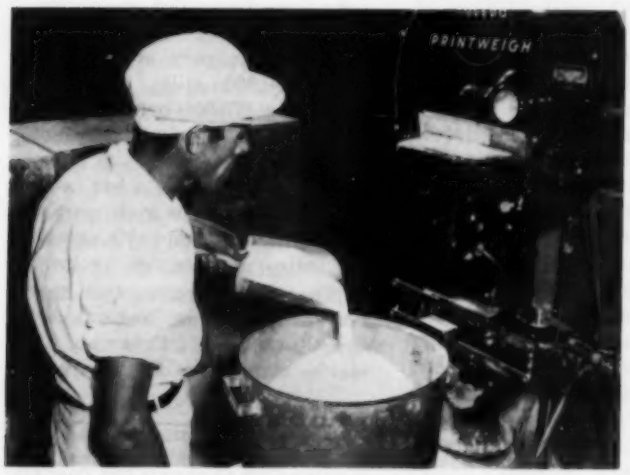
ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

Porcelain Enameling Forms Beauty 'Skin' For Home Appliances

FUSING glass on metal is big business. Americans this year will spend $3 billion for appliances and that spells porcelain enameling. Frigidaire Division of General Motors Corp. takes particular pains with the finishes it offers on its appliances. To insure quality porcelain and latest methods of application, the firm has 12 ceramic engineers. The art of applying porcelain enamel is shown in the accompanying pictures.

Worker sprays porcelain enamel on a washer top

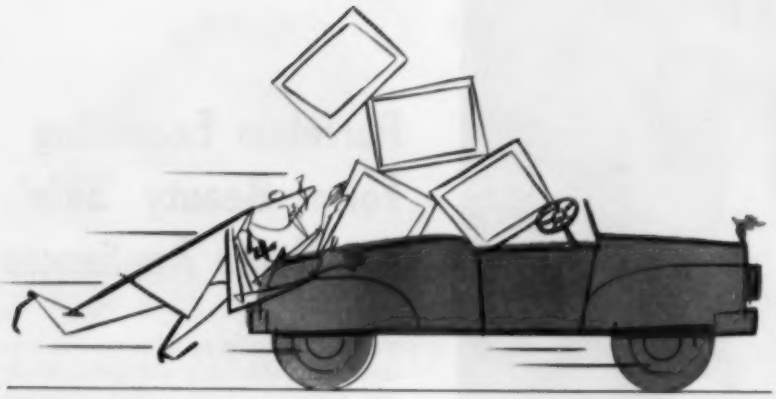


Chemicals for the enamel are carefully weighed

Cabinet liners get a ground coat of enamel

Ingredients are mixed with water in ball mill

White finish coat of enamel is sprayed on parts



Part Two

How To Put Efficiency Into Your Fleet

ABOUT ONE out of four cars registered in metropolitan areas today is company-owned. Although statistics don't differentiate fleets from Fleetwoods, company ownership doubled the last two years and is still increasing.

A major factor in this growth is the widening cost spread between company and employee ownership. Dartnell Corp. of Chicago reports the saving in company ownership today amounts to 1.26 cents per mile, compared with 1.04 cents in 1950. With company-car operating costs at 5.75 cents per mile, that adds up to a 22-per-cent saving over employee-owned car costs of 7.01 cents per mile.

Need for Specialists—Of course, the average figure given varies with geographic location and, more importantly, with the efficiency of the fleet operation. In fact, the need for specialized accounting, research and analysis in the field of business car fleets has resulted in the formation of a few competent fleet management companies.

The subscribing company receives expense reports from its salesmen or employees and forwards them to the management company for analysis and periodic statements. Fleet management companies can frequently handle these functions at lower cost than any of their subscribers, owing to specialization, pooling of information and sharing of the cost of research and analysis which volume permits.

Fundamentals — Regardless of who does the job, however, fleet management involves certain fundamentals that your company should consider.

Take the matter of which cars to buy. You can find people who maintain that Chevrolet, Ford, Plymouth and Studebaker each is the most economical to operate. Pacific Finance Co. reports that records compiled over a number of years indicate there is less than one-tenth of a cent difference per mile in operations cost among these makes of the same year. With one exception, the report also shows there is less than one-tenth of a cent difference between "model years."

Riding First Class—Incidentally, because of better trade-in allowances and improved employee relationships, the stripped fleet car is becoming a thing of the past. Trend is to buy deluxe models and more accessories. But on the matter of which make to buy, Dartnell reports operating costs don't vary enough between makes in a given price range to constitute a large consideration in choice of either make or model.

As to when to trade cars in, new and used car markets are watched closely by executives as a key to timing. In most cases the trade-in span is being extended to a 2-year, 45,000-mile replacement period for best depreciation advantage.

An Exception—But one company operating a fleet of taxis reports an average mileage at trade-in of about 150,000 miles, with some cars going 175,000 before they are uneconomical to operate. A factor here is the accumulation of mileage rapidly, often before a car is over a year old. Perhaps even more important is the company's excellent preventive maintenance program.

"The clue to economical operation of any fleet, regardless of size," says C. E. Brugman, fleet service manager of Chrysler's Far-

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A FIVE POINT PROGRAM FOR CONTROL OF ANY FLEET OPERATION

1. Specific delegation of authority and responsibility with sufficient top management attention.
2. Vehicle selection based on analyzed needs, past performance, cost records and maintenance availability.
3. Modern operation and accounting records capable of prompt analysis and immediate corrective action. The correction may involve the cars or driving personnel or both.
4. A preventive-type maintenance in which any road barrier is considered a reflection of the maintenance practices. Elimination of all road delays is the objective.
5. A planned disposal program based on sensible depreciation practices, critical operating costs and adjustments to used-car markets.

DON'T OVERMAINTAIN!

Too much preventive maintenance is often more costly than the additional operating costs it prevents. Here is one company's program:

1000 miles—Lubrication and safety check.

2000 miles—In addition to above, check compression, points, plugs, ignition timing, fan belt tightness, fuel and oil lines for leaks. Check oil, carburetor, air cleaner and oil filter cap. Check water level and battery. Check electrical connections and operations of light, horn and windshield wipers; check brake pedal reserve and find out reason if low. Check toe-in of front wheels. Check free play of clutch. Check tightness of drive line.

6000 miles—In addition to above, change oil and oil filter cartridge. Check motor mounting, tighten cylinder head bolts and adjust valve lash. Remove front wheels and check brakes for wear, since front wheel brakes wear quickest.

12,000 miles—In addition to above, repack front wheel bearings.

Engines are not disassembled by this company for major repair until oil consumption becomes over one quart every 200 miles. On most of the cars this happens at about 125,000 miles. Carburetors are replaced with rebuilt units when fuel economy drops, usually at about 35,000 miles. Other engine parts are replaced when inspection indicates replacement is necessary.

Rear end and transmissions are not drained, although this is necessary in climates with extreme seasonal variation.

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go Division, "is preventive maintenance based on good operating records."

Watch False Economy — His point: Overmaintenance of the sort suggested by oil companies and auto service managers (in some instances to further sale of their commodities) can be just as costly as not enough. Although tune-ups may be recommended at fairly short intervals—and following this procedure the engine will always run well—the regular installation of breaker plates, points, condensers and spark plugs will often cost more than the fuel wasted through neglect.

A good driver has more to do with fuel economy than a tuneup in a properly working engine, says Mr. Brugman. Smooth driving minimizes opening the power jet at traffic speeds and reduces use of the accelerator pump. Since gasoline is the largest single operating expense in cab companies, many maintain records to find drivers who are cowboys and replacements are made for those who won't cooperate.

Tailor to Your Needs—Another point on preventive maintenance: The locality and manner in which your cars are used is the primary factor in the need for maintenance. Service manuals that come with most cars tend toward overmaintenance to be on the safe side. Other fleet operators in your area or factory service men can often advise a good preventive maintenance schedule for your type of operation, which can be further modified as your fleet records indicate.

The best procedure, says Mr. Brugman, is to keep a running analysis of operating cost records. Cars operating most economically will quickly show up while abnormal expenses on other vehicles will be equally evident. Then find out why.

Paperwork Required — Vehicle operating costs are accumulated best through report forms, and cost analysis is simplified by setting up effectively engineered schedules of accounts. Use of monthly comparison records will indicate vehicles which need attention, individuals who need attention and trends which need investigation. Recapitulations of such records are management's tool for policy formation, budgeting, incentive computation, comparisons with past and estimated costs and comparing costs of fleet operating groups within a company.

Dartnell Corp. points out that as the period of use before disposal increases, maintenance increases also. However, the question of "overhaul or trade-in" actually has a simple, calculable answer.

Personnel Too—That's the case today with most questions regarding business car expense. And alert management, trying to control costs and increase fleet effectiveness, is putting more emphasis on trained, competent personnel to direct and control fleet operations on all levels.

This is the second in a series of two articles on auto expense. First appeared on Oct. 11, p. 67. Reprints of both may be obtained by writing to STEEL, *1213 W. Third St., Cleveland 13, O.*

Paperwork Under Fire

Reduction of the mountains of paperwork now required by Federal agencies is the aim of a committee formed by the Hoover Commission.

The "Paper Work Committee" is composed of businessmen in construction, farm and other industries. Its final meeting will be held Oct. 27 in Washington, when recommendations will be drafted for submission.

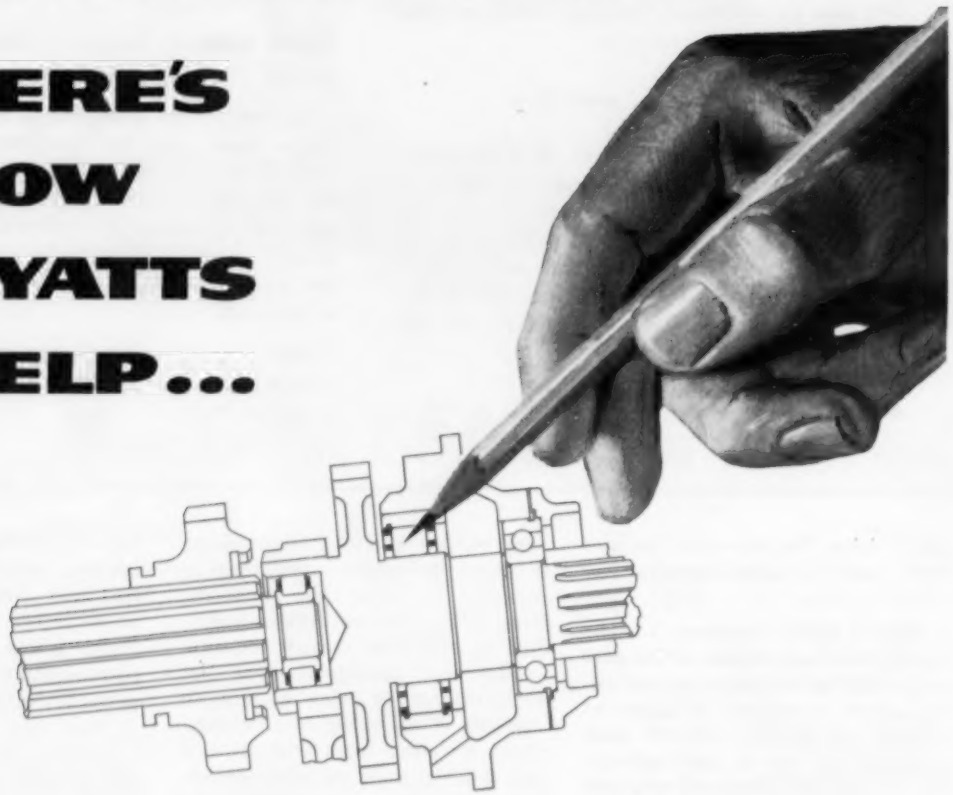
Federal Purchasing Overhaul

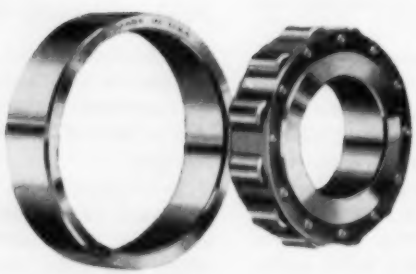
Former President Herbert Hoover has appointed a task force to study government procurement methods. Headed by Robert W. Woolcott, chairman of the board, Lukens Steel Co., it will recommend ways and means of making economies and of increasing efficiency of standard procedures.

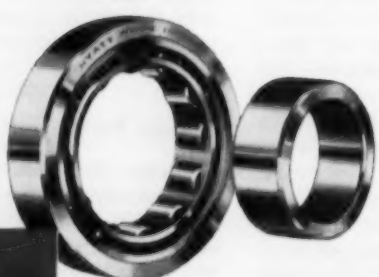
Studies will be made chiefly at the executive level of government, with procurement for defense rating special attention.

when LIMITED SPACE is a design factor

HERE'S HOW HYATTS HELP...







Sometimes a fraction of an inch is the difference between a simple design modification and costly re-tooling. And the engineer who is thoroughly familiar with Hyatt Roller Bearings will know a lot about how to save those fractions. He'll know, for example, that to gain greater shaft rigidity with the same size housing, he need only check his Hyatt catalog for a separable inner race type of bearing. This type—available in a wide range of sizes—may be applied with the rollers operating directly upon the surface of a suitably hardened and ground shaft. Thus, a larger-diameter shaft may be used without sacrificing bearing capacity, or a larger-size bearing may be used without changing the size of the shaft. For a copy of Hyatt's latest catalog, No. 150, write to Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT ◯ BARREL ◯ TAPER ◯

It looked impossible in early September, but—

30 days later victory looms near as . . .

Packard Races Nov. 1 Deadline In Assembly Plant Changeover

DETROIT

STUDEBAKER - PACKARD is an outfit where the impossible doesn't take as long.

When Chrysler Corp. purchased the Conners plant of Briggs, which was building bodies for Packard as well as Plymouth, men in the trade assumed Packard would put a body shop into its Utica plant or shop for a new contractor. This reasoning was based on the fact that the Conners facility was obviously too much body capacity for Packard to digest and the observation of a few sages that the plant would "never be capable of producing anything else."

Shipping Factor — While this speculation was going on, Packard personnel were looking over alternatives. Utica's plant was an obvious candidate, but plans were already under way to make it a modern engine, transmission and chassis part plant. And more important, it costs considerably less to truck engines and chassis parts than bodies.

At the same time, Packard people were casting a privately disturbed eye over the Grand Boulevard plant grinding out Packards as it had for some 50 years. Soaring to five stories, which necessitated a labyrinth of posts, the plant frankly didn't have it in the modern concept of how to build a car.

The Idea—Without any detailed plans of the plant to guide them, layout wizard Bob Rieneke and his boys went to work a year ago preparing a preliminary proposal for making bodies at the Conners plant, which Packard has under a lease-option-to-purchase agreement with Chrysler. It was pointed out that the building already was a body plant and contained the paint facilities on the second floor where they would be out of the dirt. Installed at a reported cost of $6 million, facilities could be used in position with the Plymouth ovens adaptable to the production of Packard sheet metal parts.

That meant no body shipping and the layout boys figured the assembly operation could be fitted into the first floor. Management made its decision and late in June Bob Rieneke took his refined layout to an auto dealer in Kansas City for his opinion. This was a special dealer, Neill Brown, who has started eight or ten assembly plants on their way to production efficiency, though he has retired from the auto manufacturing field. Mr. Brown was captured by the Packard enthusiasm and named manufacturing manager, car division. A final layout was begun by the planners about the middle of July. By August 15 the layout was completed; then the impatient miracle men had to wait three weeks until the last Packard body was built before they could begin tearing things up.

The Start—That's literally what happened. In one step the entire overhead rigging of pipes and conduit was pulled down from the ceiling. It is estimated that 35 or 40 miles of pipe had to be rerouted. Construction men won't venture a guess as to how many cubic feet of earth were moved or how many sewer lines were jogged around newly planned obstructions. Neill Brown estimates that not a single

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light will remain unchanged in the plant when the revision is completed.

To do this job in a year would not be slouching. But to equip an assembly plant from scratch to 90 per cent complete in just 30 days after work was actually begun is a feat any production man finds difficult to gulp down. Steamfitters, plumbers, conveyor erectors, electricians and all the rest are working at the same time on the job and seem to have caught the challenge of the situation.

Behind the Scenes—In the meantime, plenty of management meetings are going on. Almost a hundred charts detail the parts of the car, the tools to produce it and the equipment needed for the plant with the date it must be ready. As hot spots develop they are quickly pinpointed and action taken to correct the situation. Executives at lunch are haunted by a calendar clock with a hand marking the days and a reminder about deadlines.

A walk through the plant reveals that plenty of deadlines have already been met. In place is the new Packard water-test booth, which should be a soaker to the industry. Cars will be brought down the final assembly line without interior trim and subjected to a water test of 280 gallons per minute. Leaks found on the car will be repaired from the inside and it will be rechecked in a second booth. Then the interior trim will be put in place as the last bit of assembly.

The water test, incidentally, also serves as a potent car wash necessary in any plant to remove finger prints, etc., after assembly.

The Business End—A number of other touches in the new plant should prove interesting to industry men. Among them is the new Packard final line, a 500-foot long flat-top conveyor flush with the floor. A single strand carrying the wheels on one side of the car will do the job on the straights with double strand picking up the car around the corners. Among advantages cited for this time-and-money-consuming installation are the fact that it won't damage the car; a car can be driven off at any point for repairs, and supplies can be trucked directly across the conveyor to the area of utilization.

One rather nightmarish incident occurred in the installation of the final line. Directly in the path of the line was an uncharted block of concrete 6x6 feet square and 90 feet long. Used some years previously as a support base for aircraft wing jigs, the block lies today exactly where it was before. The final line goes beside it, not quite as perfectly aligned with the final touch-up ovens as earlier layouts planned.

Double Duty—About four miles of conveyor, in addition to the final line, were installed overhead to handle front ends, hoods, bumpers, doors, roofs, instrument panels, front suspensions, etc. Several layers deep in some spots, the conveyors will serve as transport and/or storage lines depending on the part.

Following the rear axle and suspension build-up, this unit will be picked up automatically by a monorail from the floor conveyor and routed to the chassis build-up. There, among other features, is the wheel drop—wheels are not lifted by the worker but merely rolled into place as the chassis comes by and fastened. Another trick in the chassis line is a bit of compromising in which the chassis is taken up through a balcony and returned to the first floor to double back over itself and complete the circuit.

Final Touches — Packard bodies will be built up, using relocated equipment formerly used for the job. Bodies in white will travel on a floor conveyor up to the second floor, after a stop at a newly installed lead and solder booth, to move through the paint setup utilized in place. The only shift in facilities was the lacquer polish booth. Former Plymouth ovens were changed over to handle Packard sheet metal as planned.

Body trim starts on the second floor after body drop.

The Conners plant is shaping up, and Ray Powers feels confident his manufacturing team is going to meet the Nov. 1 deadline. Process engineers are setting up the detail work to be done in building the car, with superintendents and foremen working with them to translate each detail into a man and the hand tools he needs to do the job. Work is also under way to determine teletype locations for scheduling and routings of received parts to point of use.

The Result — When the job is completed, the plant will operate on a three-day minimum inventory of all items, a striking accomplishment in view of the space shortage some predicted would exist. What's more, the plant is expected to prove capable of equalling the production of the present Grand Boulevard plant in only one-third the space.

How's that for a summer's work?

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,249	684,843
June	623,732	713,778
July	543,534	756,592
August	523,785	640,186
September	364,433†	605,228
October		651,153
November		457,852
December		529,588
Total		7,815,877
Week Ended	**1954**	**1953**
Sept. 11	84,556	122,863
Sept. 18	74,026	146,912
Sept. 25	71,017	140,953
Oct. 2	84,110	142,824
Oct. 9	82,757	148,779
Oct. 16	89,000*	152,743

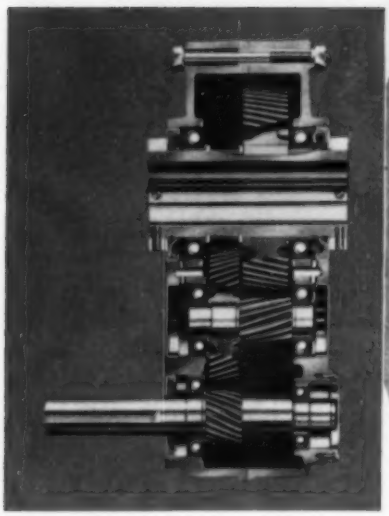
Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

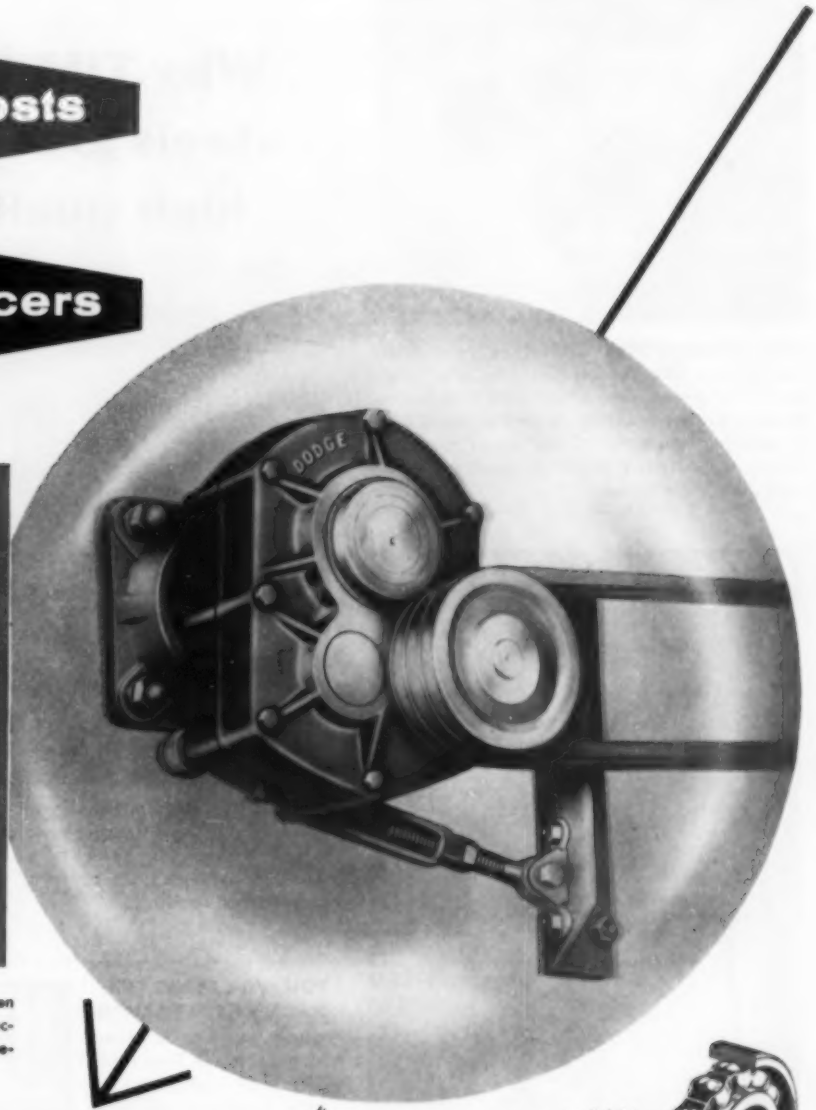
Chrysler Goes Tubeless

Official intelligence arrives this week that all Chrysler Corp. cars will have tubeless tires as standard equipment in 1955. This report contains the exciting news that engineering tests conducted by the corporation indicate the tire has greater resistance to effects of punctures, and as if that weren't enough, it increases protection against blowouts, provides up to 12 per cent more tire mileage and 15 per cent greater skid resistance due to new flatter treads.

Other firms are expected to make similar announcements soon.

Reducing Costs in Speed Reducers





New Departure **ball** bearings are used in seven basic sizes of the Dodge single and double reduction speed reducers, handling from 1 to 43 horsepower at output speeds from 12 to 330 r.p.m.

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BOSTON	517-A Park Square Bldg.	Hancock 6-9867	**CINCINNATI**	2107 Carew Tower	Main 5783	**MILWAUKEE**	647 W. Virginia St.	Broadway 6-9460
KANNAPOLIS, N. C.	P. O. Box 1086	2-3181	**CLEVELAND**	3113 W. 110th St.	Winston 1-5454	**ST. LOUIS**	3001 Washington Blvd.	Franklin 6533
NEW YORK	1775 Broadway	Circle 6-1540	**INDIANAPOLIS**	1357 W. 18th St.	Imperial 4680	**LOS ANGELES**	5035 Gifford Ave.	Logan 8-2301
PHILADELPHIA	850 E. Luzerne St.	Garfield 3-4136	**PITTSBURGH**	Cathedral Mansions	Mayflower 1-8100	**BERKELEY**	1716 Fourth St.	Landscape 6-8750
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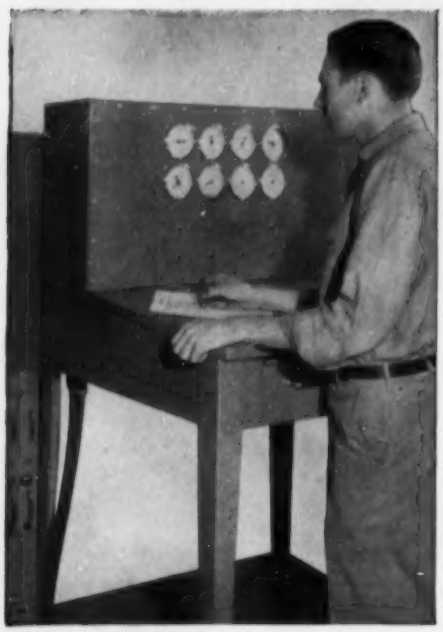

RIGIDLY CONTROLLED CHEMISTRY assures you of uniform composition in every forging bar. This spectrometer, for example, tells the exact composition of a melt in just 40 seconds. Results are flashed back to the furnace so the melter can maintain constant control of the heat analysis.

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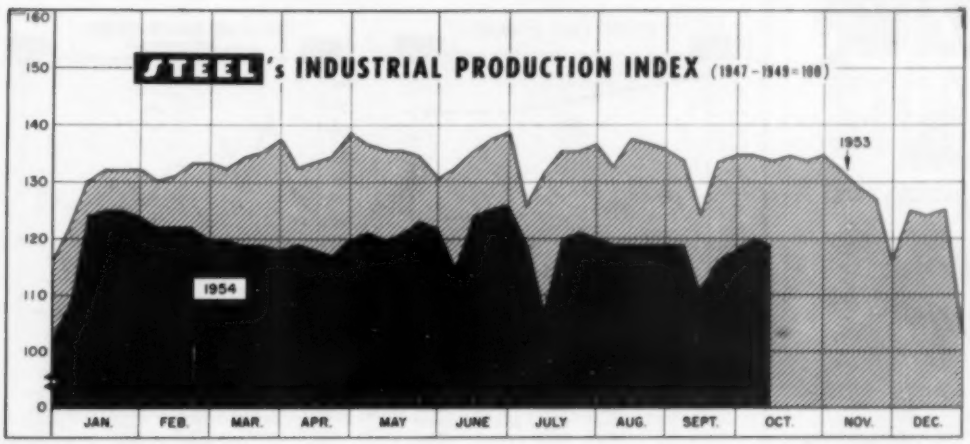
YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



LATEST WEEK*	119
PREVIOUS WEEK	120
MONTH AGO	111
YEAR AGO	134

* Week ended Oct. 9.

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

More Business Weather Vanes Point Upward

EMPLOYMENT is rising. Gains aren't as big as many hoped, but there are definite signs that further improvement is in the offing.

And for a change, metalworking is sharing in the pickup. That's encouraging in itself. Durable goods in general and metalworking in particular were among the hardest hit industries during the business slowdown.

Seasonal Factors — Nationwide nonfarm employment went up a half-million in September.

That's only the normal seasonal rise, and much of the gain stemmed from reopening of schools. But fabricated metal products and machinery (including electrical) were among metalworking categories registering increases.

Primary metals and transportation were down a little, but an upturn is on the way. Steel production has been gaining steadily for over a month now, so some improvement should be noted when October figures are in. The automotive industry is just emerging from one of the most extensive changeovers in history. Hiring is just beginning to pick up. Some gain will be shown in October, but it will be November before employment is close to "normal."

Magic Number—When that happens, coupled with the upturn in steel, nationwide unemployment should drop under the 3-million mark, which has been a sort of magic number through the recession.

Increasing production is being registered in workers' pay envelopes. Average work week for factory production workers is 39.7 hours. Average hourly earnings are up 2 cents from August to $1.81, and weekly earnings are $71.86, an increase of 80 cents over August and 44 cents over last year.

Purchasing Power—What's even more important, workers have over a dollar a week more take-home

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,724	1,692	2,172
Electric Power Distributed (million kwhr)	9,075[1]	9,158	8,307
Bitum. Coal Output (daily av.—1000 tons)	1,333	1,390	1,538
Petroleum Production (daily av.—1000 bbl)	6,137[1]	6,145	6,313
Construction Volume (ENR—millions)	$192.9	$233.8	$382.6
Automobile, Truck Output (Ward's—units)	82,757	84,110	148,779
TRADE			
Freight Car Loadings (unit—1000 cars)	707[1]	722	804
Business Failures (Dun & Bradstreet, no.)	185[1]	192	186
Currency in Circulation (millions)[3]	$30,051	$29,922	$30,374
Dept. Store Sales (changes from year ago)[3]	−2%	+3%	−3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,291	$18,115	$18,178
Federal Gross Debt (billions)	$278.9	$274.7	$272.9
Bond Volume, NYSE (millions)	$15.3	$14.8	$13.1
Stocks Sales, NYSE (thousands of shares)	10,788	9,494	4,906
Loans and Investments (billions)[4]	$83.3	$83.0	$78.9
U. S. Gov't. Obligations Held (billions)[4]	$35.7	$35.9	$31.7
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.19	189.38
STEEL's Nonferrous Metal Price Index[6]	218.8	218.2	203.5
All Commodities[7]	109.6	109.7	110.3
Commodities Other Than Farm & Foods[7]	114.6	114.5	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1839=100. [7]Bureau of Labor Statistics Index. 1947-1949=100.

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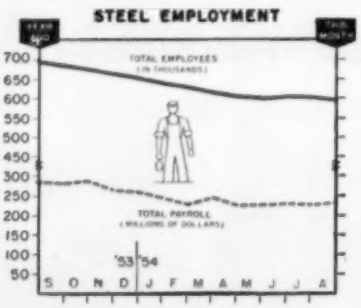
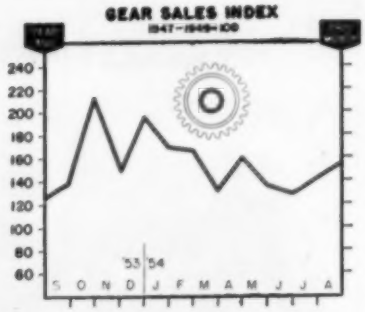
THE BUSINESS TREND





	Employment in Thousands		Payroll in Millions	
	1954	1953	1954	1953
Jan.	645	685	$251.3	$261.3
Feb.	636	685	236.6	261.3
Mar.	621	683	249.7	281.0
Apr.	609	685	232.6	278.0
May	606	685	234.4	281.0
June	609	690	236.4	282.1
July	608	696	232.8	288.1
Aug.	601	696	238.8	287.3
Sept.	...	688	....	283.8
Oct.	...	678	....	290.6
Nov.	...	667	....	268.5
Dec.	...	656	....	263.9

American Iron & Steel Institute.

	1954	1953	1952
Jan.	167.4	161.4	670.6*
Feb.	165.1	188.1	539.5*
Mar.	128.6	158.9	517.1*
Apr.	158.2	217.1	478.7*
May	132.5	189.8	425.9*
June	127.4	146.5	452.3*
July	141.3	120.7	145.3
Aug.	154.7	121.6	132.3
Sept.	....	135.6	143.4
Oct.	....	211.1	160.8
Nov.	....	144.9	150.9
Dec.	....	194.0	140.9

*(1935-39=100)
American Gear Mfrs. Assn.

Charts Copyright 1954 STEEL.

pay than they did a year ago.

Additional signs of reviving industrial activity are plentiful. The new order index of industrial supplies of the American Supply & Machinery Manufacturers' Association rose to 132.5 in August (1947-1949 = 100). The July figure of 119.4 was the lowest since mid-1950.

Room for Improvement . . .

Even the August pickup leaves the index considerably under the level of last year and far under the indexes of early 1951 when the Korean war boosted the order index to 239.0.

Along the same lines, Purchasing Agents of Chicago report that several of their business barometers turned upward in September. Profits, order backlogs and employment headed the list. Continuing improvement can be inferred from the strength and stability of prices and expanding production.

Also noted by the PAs is a slowdown in inventory reduction. Buying is still short-term because of the excellent delivery situation on most items. Production is reported as holding its own or getting better by 84 per cent of the purchasing group's survey respondents.

Foundry Ordering Inches Up . . .

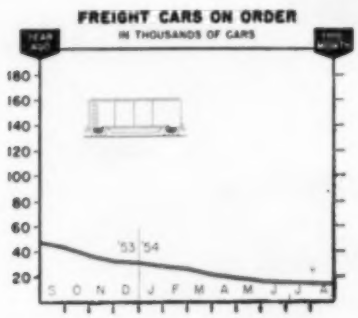
Foundry equipment showed some increase in activity in August, picking up to 75.6, as recorded by the Foundry Equipment Manufacturers Association index (1947-1949 = 100). The July figure was 68.8.

This can't be regarded as a positive indication of better things to come, though. Foundry ordering has been erratic all year. For example, in August, 1953, the index was 236.3. By October it was down to 87.2, the year's low. In January, 1954, it was up to 173.8, back down to 82.7 in March, then up to 125.3 in April. The slide hit bottom in July. If the rest of this year follows 1953, it will be November before much solid upturn is noted.

Profits Hold the Line . . .

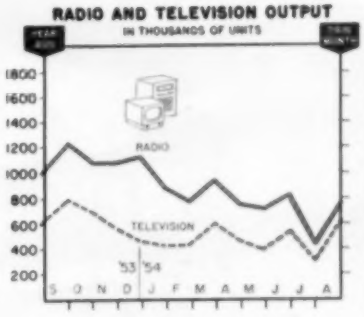
An encouraging picture for the rest of the year is painted by Henry H. Heimann, executive vice president of the National Association of Credit Men. After analyzing the results of an annual survey of credit executives, he concludes:

Profits and dividends will hold up well in the months ahead. Mar-



	Awards		Backlogs (end of month)	
	1954	1953	1954	1953
Jan.	2,942	7,406	27,959	77,414
Feb.	2,057	2,284	25,441	71,882
Mar.	348	3,247	20,966	68,553
Apr.	909	2,102	17,817	62,637
May	1,071	1,645	15,615	57,345
June	1,139	1,453	13,860	52,315
July	883	1,671	12,889	47,423
Aug.	2,425	3,913	13,013	45,735
Sept.	....	3,867	.....	42,198
Oct.	....	1,705	.....	35,171
Nov.	....	2,858	.....	31,869
Dec.	....	2,159	.....	29,950
Total	....	34,310		

American Railway Car Institute.



	Thousands of Units			
	Radio		Television	
	1954	1953	1954	1953
Jan.	872	1,093	421	719
Feb.	709	1,192	427	731
Mar.	940	1,549	600	810
Apr.	745	1,159	458	568
May	722	1,109	396	482
June	838	1,164	544	524
July	438	674	307	316
Aug.	785	992	633	604
Sept.	...	1,217	...	770
Oct.	...	1,052	...	680
Nov.	...	1,066	...	560
Dec.	...	1,101	...	450
Total	...	13,368	...	7,214

Radio-Electronics-Television Mfrs. Assn.

keting of new products is helping some companies here, as are better management and higher efficiency.

Expenditures for plant and equipment will be maintained at a high rate but somewhat below present peaks. Borrowing needs of business will show a continued decline unless something unforeseen happens.

The labor situation looks good, with only a few companies expecting any trouble. Factory workers seem better satisfied, and absenteeism in plants and offices is falling off. But predicted for the near future are labor demands for more fringe benefits, including longer vacations, more pensions, welfare considerations and insurance.

Radio, TV Output Climbs . . .

August signaled the fall upturn in the radio and television business. Output of TV sets more than doubled July production, and radios gained over 50 per cent, according to Radio - Electronics - Television Manufacturers Association.

September will probably show up even better than August and could be the best month of the year. Outlook for the rest of the year is for monthly production somewhat above the August figures of 633,387 TV sets and 785,499 radios.

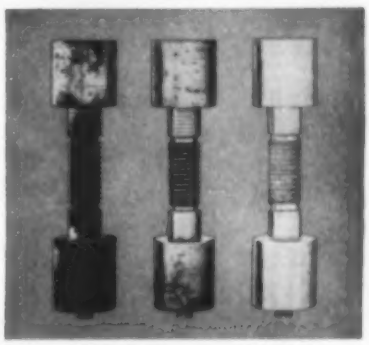
Accompanying the rise in receiver output, tube sales had their best month of the year. Sales on both cathode ray tubes and receiving tubes are still under 1953 levels, but prospects look good.

Trends Fore and Aft . . .

Metal Treating Institute reports national billings of its members went up almost 3 per cent in August. The trend should be upward through fourth quarter. . . Construction contract awards show a tendency to slack off in October, but September saw more records set. It will take a real crash to keep 1954 from seeing new all-time peaks reached. . . Construction costs went to a new high in third quarter, reports Aberthaw Co., Boston. The advance was caused chiefly by rises in wages of ironworkers and plumbers and increased cost of steel materials. . . . The construction boom is shifting westward. Areas west of the Mississippi were behind last year at the end of first half. Now they're ahead or close to it. Some signs of slackening are showing up in the mid-Atlantic area. New England is still going strong.

NEW WAY TO STOP RUST

Easily! Quickly! Without Slushing!



Without VPI With VPI

MARVELLUM

vpi WRAP

Paper coated with a Volatile Corrosion Inhibitor

Look at these steel samples—they tell the story. After 3 years of unsheltered storage outdoors in an industrial marine atmosphere, only the VPI wrapped sample on the right is still bright and clean. The untreated sample on the left was wrapped in plain kraft, the middle one treated with a good rust-preventive oil and wrapped in Grade A barrier material. All were overwrapped with kraft-asphalt paper.

A special coating on the VPI paper vaporizes . . . forms an invisible protective film that positively prevents rust.

Marvellum VPI is easy to use . . . just fold the paper over the part. No need for time-consuming slushing or greasing. No mess or costly cleaning when the item is unwrapped. It's bright and clean, ready for immediate use.

You'll find many uses for Marvellum VPI in your plant . . . wrap steel parts, protect inventories, line tote boxes.

Marvellum VPI is available in rolls of 20, 30, 40 and 60 lb. paper stock and can be individually imprinted with your trademark on quantity orders. Envelopes, sheets, bags, shrouds and tubes are also available.

Marvellum VPI Wrap is made in compliance with Military Packaging Specification MIL-P-3420.

FREE BOOKLET
Gives you all the facts.
Send for your copy today.

The Marvellum Company
1 Appleton Street Holyoke, Mass.

CARBON STEEL ROLLS • OHIOLOY ROLLS • OHIOLOY "K" ROLLS • OHIO DOUBLE-POUR ROLLS • HOLL-O-CAST ROLLS • CHILLED IRON ROLLS • DENSO IRON ROLLS • NICKEL GRAIN ROLLS • SPECIAL IRON ROLLS • NIOLOY ROLLS • FLINTUFF ROLLS

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • Plants at Lima and Springfield, Ohio

ROBERT K. HENDERSON
. . . National Tube's plastic pipe sales mgr.

J. WALTER GULLIKSEN
. . . gen. mgr., Waterbury Mfg.

A. G. LINDQUIST
. . . Gardner-Denver v. p.

Robert K. Henderson was made manager of sales for **National Tube Division's** new plastic pipe products. He has been manager of market development for this division of U. S. Steel Corp. at Pittsburgh, and is succeeded in that position by **Samuel W. Verner.**

Frank M. Hawley was elected chairman and **Stanley J. Roush** president and general manager of **Morse Chain Co.**, Chicago, a subsidiary of Borg-Warner Corp. Mr. Roush is also president of Atkins Saw Division, a position he retains.

Charles K. Garrison joined **Calumet Steel Castings Corp.**, Hammond, Ind., as sales manager and engineer of all alloy steel castings.

Walter E. Teschke succeeds **Frank D. Norton,** retired, as order and schedule manager at the Spaulding Works of **Crucible Steel Co. of America,** Harrison, N. J. Mr. Teschke joins Crucible after 15 years' service with John A. Roebling's Sons Corp. where he was senior industrial engineer.

John C. Winget was named manager of **Armco Steel Corp.'s** marketing service department, Middletown, O. He is replaced by **Raymond G. Sloan** as manager, development engineering.

Chase Brass & Copper Co. Inc., subsidiary of Kennecott Copper Corp., appointed **J. Walter Gulliksen** general manager of **Waterbury Mfg. Co.**, Waterbury, Conn.

W. Paul Smith, executive vice president, was elected president of **Control Instrument Co. Inc.,** Brooklyn, N. Y., subsidiary of Burroughs Corp. He succeeds **John J. Hyland,** now chairman of the board.

John A. Wettergreen, works manager of the South Milwaukee plant of **Bucyrus-Erie Co.**, was placed in charge of manufacturing activities of all company plants.

August E. Klinger was named president of **Buffalo Steel Corp.,** Buffalo, which was formed to take over the Buffalo Steel Division of H. K. Porter Co. Inc., recently purchased by Rochester, N. Y., interests. **Saul Frankel** will be chairman; **James L. Frankel** and **William S. Truesdell** will be vice presidents.

Chrysler Corp., Detroit, elected **Clyde C. Williams** vice president-sales, marine and industrial engine division.

Ray K. Serfass, general sales manager, and **J. M. L. Joslin,** industrial relations manager, were named vice presidents of **York Corp.**, York, Pa.

A. G. Lindquist, secretary-comptroller of **Gardner-Denver Co.,** Quincy, Ill., was elected vice president. He continues in his previous positions.

E. Warren Hunziker is the new division superintendent-open hearth and foundry for the Geneva Works of U. S. Steel Corp.'s **Columbia-Geneva Steel Division,** Geneva, Utah. He was superintendent of the open-hearth department at the Pittsburg, Calif., works.

G. M. Giannini & Co. Inc., Pasadena, Calif., elected **J. Murray Wilson** vice president-treasurer.

Joseph T. Ryerson & Son Inc., Chicago, appointed **Raymond N. Carlen** assistant to the vice president in charge of operations. He formerly was assistant operating superintendent at the firm's Chicago plant.

L. R. Farrell joined the high frequency division of **Lindberg Engineering Co.,** Chicago. He will specialize in motor generator induction heating sales. Mr. Farrell has been with the Tocco Division of Ohio Crankshaft Co. for the last 12 years.

William P. Feeley retires as president of **Great Lakes Dredge & Dock Co.,** Buffalo, to become chairman of the board. He is succeeded as president by **Eugene K.**

WALTER H. PRINE
. . . named section head by Inco

Lydon, former executive vice president.

Walter H. Prine is now head of the electroplating-chemical-catalyst section of the nickel sales department of **International Nickel Co. Inc.,** New York. He joined Inco in 1945 as a member of the plating section of the sales department.

E. L. McReynolds was appointed a sales engineer for **Republic Steel Corp.'s** Union Drawn Steel Division at Massillon, O.

William H. Kehoe was made trade sales manager of **National Lead Co.'s** Atlantic branch at New York.

Andrew J. Kemp was made manager of the Baltimore plant of **A. M. Castle & Co.**

Frank E. Adams was made district sales representative for **U. S. Steel Corp.'s** coal chemical division, with offices in San Francisco. He succeeds **William G. Souder,** transferred to division headquarters in Pittsburgh as product manager for light oils.

Gen. Walter Bedell Smith, retired under secretary of state, was elected vice chairman of the board of **American Machine & Foundry Co.,** New York.

Gar Wood Industries Inc., Wayne, Mich., appointed **H. J. Howerth** product sales manager for its truck winches and cranes. He was assistant sales manager for hydraulic hoists and dump bodies.

Roger L. Dailey was made division manager of **National Supply Co.'s** eastern division with headquarters at Toledo, O. He succeeds **William Van Fleet,** who will handle major accounts in the Pittsburgh area.

Karl Schwartzwalder was named director of research and **Dr. Wilfred A. Bychinsky** was promoted to assistant chief engineer, **AC Spark Plug Division,** General Motors Corp., at Flint, Mich.

Fairmont Railway Motors Inc., Fairmont, Minn., appointed **John J. Schnabel** purchasing agent to succeed **H. D. Fitz,** retired.

Tom W. Burnes is now associated with **John S. Barnes Corp.'s** eastern office. He will represent the firm in the New England division, with headquarters at Trenton, N. J. **Bert McCleneghan,** manager of the Chicago sales office, will have general supervision of the newly opened Milwaukee office.

Harvey A. Craig was made manager of sales, Bolt & Nut Division, **Republic Steel Corp.,** Cleveland. He was Pacific Coast sales manager for Republic, and is succeeded by **Henry A. Bourne,** formerly district sales manager of the Tulsa, Okla., office. **Curtis C. Snyder,** assistant district sales manager at Los Angeles, becomes sales manager in that location. Mr. Craig succeeds **Robert C. Klemm** at Cleveland. Mr. Klemm continues with the bolt and nut division in an advisory capacity with the title of assistant manager of sales, in charge of certain special assignments. The changes are effective Nov. 1.

George R. Greenman was made general sales manager, **Prepo Corp.,** Edgerton, Wis.

C. Parke Anderson was made sales manager of Thomas Truck & Caster Co.'s newly acquired division, **Lanham Skid Co.** He has offices in Keokuk, Ill. He has been assistant sales manager for Thomas for the last two years.

Robert Insley was appointed chief product engineer for the aircraft engine division of **Ford Motor Co.** at Chicago. He succeeds the late **Ralph N. DuBois.** Mr. Insley has been manufacturing vice president of Continental Aviation & Engineering Corp.

Andrew J. Kutler was made manager of sales and service for **Stanley Aviation Corp.,** Buffalo. He succeeds **Edmund O. Carmody,** resigned to form his own company.

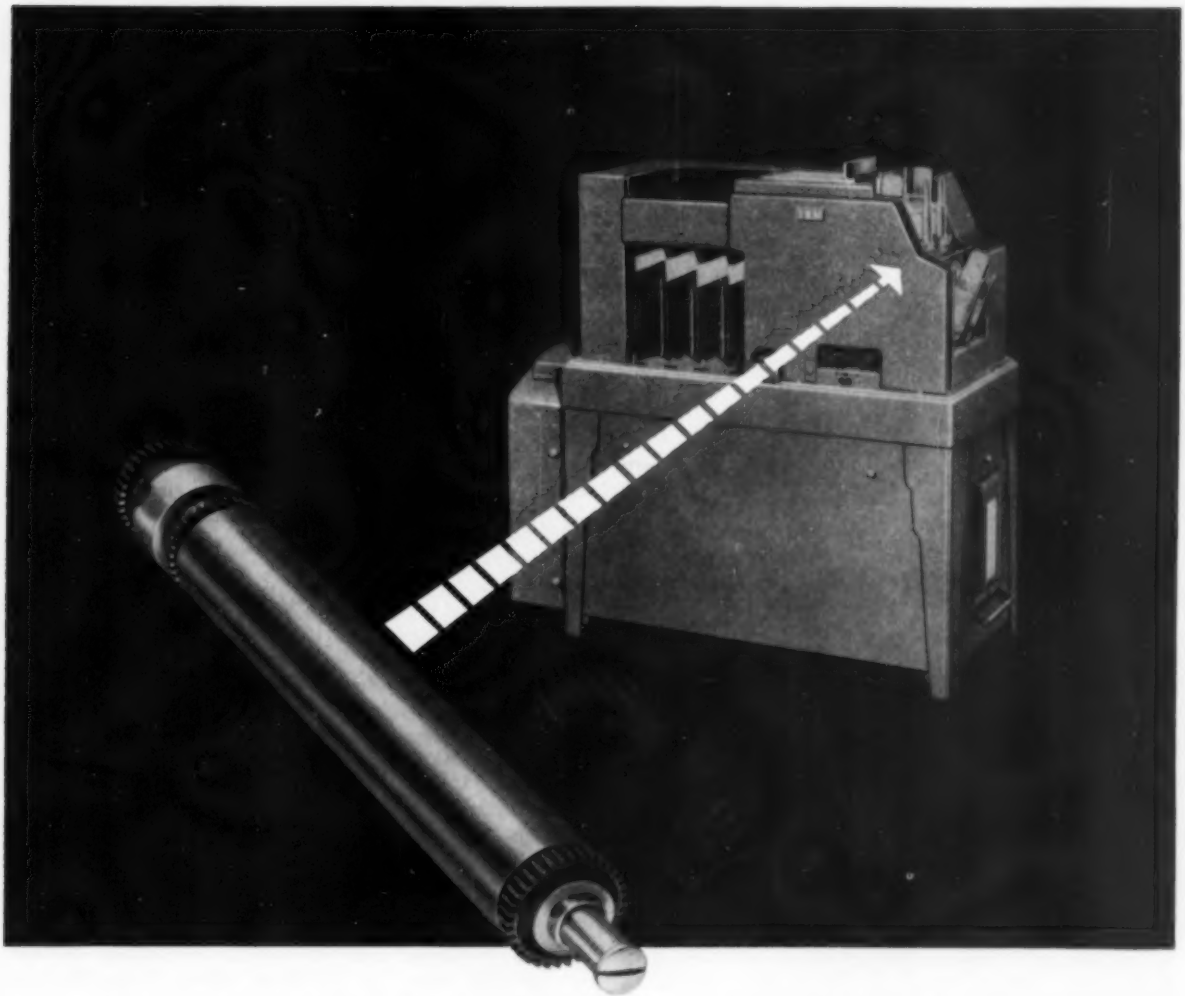
Edwin S. Ladley was made purchasing director for **Hercules Powder Co.,** Wilmington, Del. He succeeds **Lawrence J. Finnan Jr.,** who retires at the end of the year.

W. H. Murphy, works manager, **Martin-Parry Corp.,** Toledo, O., was promoted to vice president in charge of manufacturing. He

HARVEY A. CRAIG

HENRY A. BOURNE

. . . sales managers appointed by Republic Steel Corp.



Out of IBM's Collator pops a tubing idea for you!

This is IBM's Collator—a mechanical super-accountant that shuffles, selects, matches and merges punched cards at the rate of four per second!

Heart of this electronic gee-whizzer is an extraordinary kind of tubing—a contact roll over which the cards must pass. Eighty miniature, hard steel brushes finger each card as it skims by—penetrate it through pre-punched holes, touch the contact roll and close the electronic circuit—flipping the card into the right slot.

Collator contact rolls must have good wear resistance to stand this high-speed workout. And they must resist corrosion and be good electrical conductors. So IBM employs Superior WELDRAWN® Beryllium Copper and low carbon steel composite tubing for Collator contact rolls. This tubing meets IBM's tight specifications for wear resistance, peak hardness and conductivity. Superior supplies the composite tube in 1⅛" O.D. with .049" wall.

When tubing troubles put the hex on your plans, call on Superior.

We have years of experience, the modern test and development facilities, and more than 55 analyses in many metals to unravel your problem. Write for a copy of our new Technical Bulletin #7-2 on Seamless and WELDRAWN® Beryllium Copper Tubing. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Round and shaped tubing available in Carbon, Alloy and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium

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All analyses .010" to ⅝" O.D.
Certain analyses in light walls up to 2½" O.D.

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HEBER L. NEWELL
. . . Denison Eng. asst. gen. mgr.

WILLIAM J. FREUND
. . . div. sales mgr. at Victor Adding

WILLIAM L. LUTES
. . . McKay department manager

joined the company in 1952 as works manager.

Heber L. Newell was appointed assistant general manager, **Denison Engineering Co.**, Columbus, O. He was formerly general manager of Barrett-Cravens Co.

Howard A. Johnston succeeds **S. W. Brandel** as president of **Marlin-Rockwell Corp.**, Jamestown, N. Y. Mr. Brandel becomes chairman of the board. **Bernard J. Shallow** succeeds Mr. Johnson as general sales manager.

T. O. Ulmer was promoted to the newly created post of vice president in charge of sales for **AP Parts Corp.**, Toledo, O.

M. C. Crockett, Detroit district manager for **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif., was appointed to the new position of automotive industry manager for the company.

James C. Westfall is manager of sales production co-ordination, mechanical goods division, **United States Rubber Co.**, New York. He formerly was assistant to the vice president and division general manager.

William J. Freund was made sales manager of the new Electri-Car Division, **Victor Adding Machine Co.**, Chicago. For the last few years he served as advertising director of Nesco Inc., and prior to that was general sales manager, Huffman Mfg. Co.

Walter S. Snodell was made sales manager, special products division, **Acme Steel Co.**, Chicago. He succeeds **W. M. Minehart,** retired.

Carl J. Koelsch Jr. was appointed associate director of purchases of **Trailmobile Inc.**, Cincinnati.

William L. Lutes was appointed manager of the hard surfacing department of **McKay Co.'s** electrode division at its York, Pa., plant.

John B. Seastone was made research and development manager, metals division, **Olin Mathieson Chemical Corp.**, East Alton, Ill.

Walter J. Assel of Canton, O., was appointed engineering consultant on smoke, dust, fume and gas control problems pertaining to steel mills and electric furnaces by **Mechanical Industries Inc.**, Pittsburgh. Mr. Assel recently retired as chief engineer, steel and tube division, Timken Roller Bearing Co.

John B. Dickey was elected comptroller of **Michiana Products Corp.**, Michigan City, Ind.

George R. Thompson joined the executive staff of **Giffels & Vallet Inc.**, Detroit.

Virgil B. Pettigrew, former general supervisor in charge of scheduling and change control at **Temco Aircraft Corp.**, Dallas, was made assistant manager of manufacturing control. He succeeds **Robert L. Lewis,** recently named assistant director of contract administration.

Victor V. Myers Jr. is field engineer in charge of the newly formed Albuquerque, N. Mex., district office, **CEC Instruments Inc.**, sales and service subsidiary of Consolidated Engineering Corp.

Robert H. McLarn was made sales engineer in the Chicago area for **Star-Kimble Motor Division,** Miehle Printing Press & Mfg. Co., Bloomfield, N. J.

Philip R. Marsh was named manager of western operations division of **Flexible Tubing Corp.** He has offices in Pasadena, Calif.

L. P. Kahler was made product manager, paint sales division, **Joseph Dixon Crucible Co.**, Jersey City, N. J.

Robert L. Reed was made Pittsburgh district manager, **Electro Metallurgical Co.**, a division of Union Carbide & Carbon Corp.

Robert P. Marks and **Randolph E. Bailey,** newly appointed sales engineers for the San Jose, Calif., division of **E. W. Bliss Co.**, will represent its subsidiary, Die Supply Co., in, respectively, northern and southern California.

Penn Metal Co. Inc., New York, named **Edward T. Otte** manager of its research and development department.

Wilbur T. Blair, vice president-treasurer, Sharon Steel Corp., was elected a director of **Mullins Mfg.**

'round the clock with CF&I-WICKWIRE WIRE

In this advertisement we continue to take you through a typical day in the life of John Q. Citizen . . . showing you the part CF&I-Wickwire Wire plays in his everyday activities. Our last advertisement took us through John's bedroom, the nursery and the kitchen.

garage—8:30 a. m. A lucky fellow, John rides to work every day in his car. This is his garage. Notice that it has a smooth-operating overhead door. What makes it swing up? A large spring. And—you guessed it—it's made from CF&I-Wickwire Wire.

automobile — 8:35 a. m. CF&I-Wickwire Wire contributes much to the comfort and efficiency John gets from his car. There's wire in the springs of the seat and back cushions. Under the hood in the valve springs and the starter spring—to mention just a few of the places where wire is used.

highway—8:45 a. m. Notice the ribbon of concrete over which John's car rides smoothly to its destination. Many people, just like John, fail to realize that what holds it together is Welded Wire Reinforcement Fabric—another of the products that use CF&I-Wickwire Wire.

Watch for the balance of John's day in succeeding advertisements that take him to his office, through his plant and finally home to the relaxation of his living room.

FOR THE WIRE YOU REQUIRE - CHECK CF&I-WICKWIRE

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

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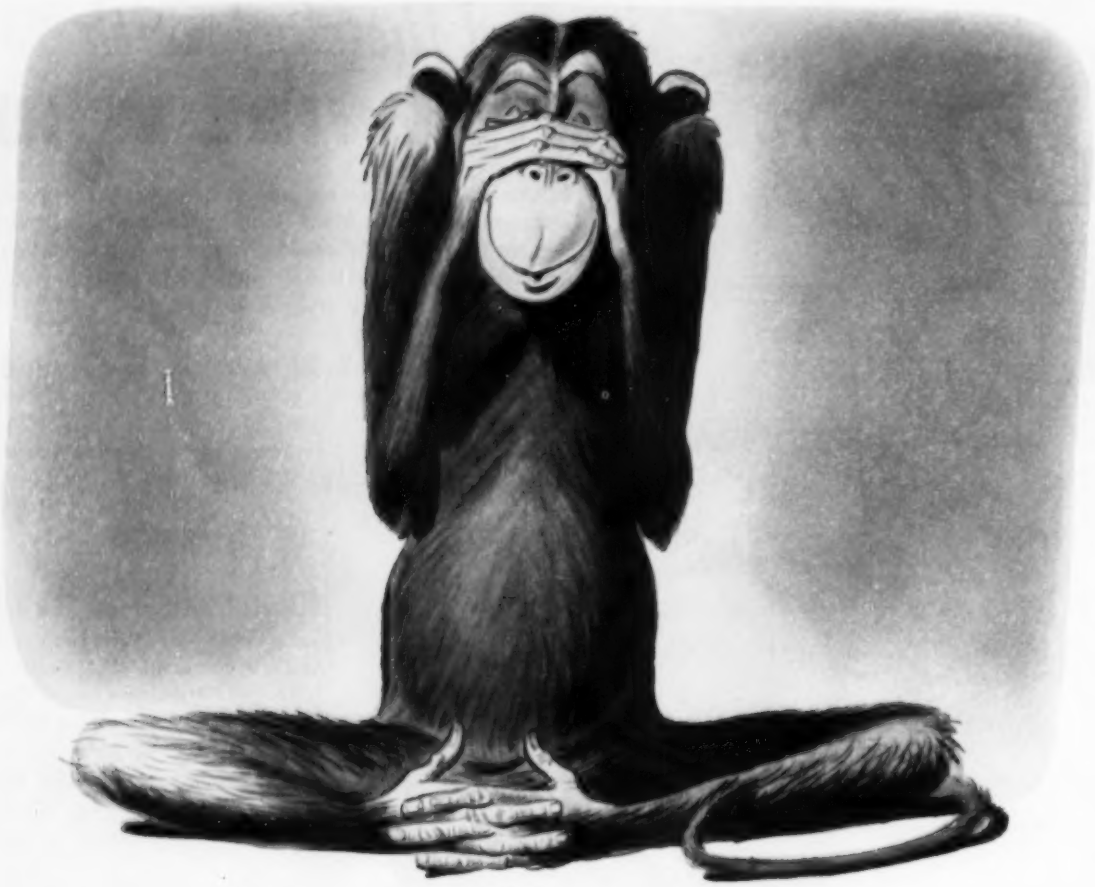

no "blind spot" on weight indications?

ask Fairbanks Morse

Fairbanks-Morse knows better than anyone else that a dependable scale mechanism is only one part of accurate weighing.

The rest? Minimizing the human element!

Fairbanks-Morse Scale Engineers created the Direct Reading Dial . . . virtually a dial behind a dial . . . that eliminates the chance for human reading errors. Regardless of the number of drop weights applied, weights are always read at the point of the indicator. As each drop weight is applied, the inner chart revolves, automatically changing the figures on the chart. No need for mental calculations . . . no need to add to the reading on the chart.

Starting in 1830 with the invention of the lever system which makes modern weighing practical, Fairbanks-Morse has consistently led in major scale developments, including the latest electronic weighing equipment. That's why, in every industry, in every land, Fairbanks-Morse Scales are known and respected. Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Ill.

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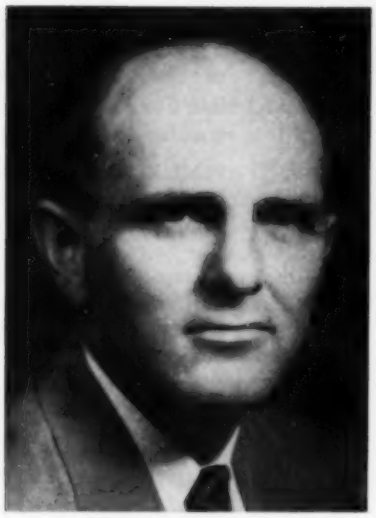
a name worth remembering when you want the best

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS



WILLIAM W. KUYPER
. . . GE department manager

RICHARD J. WHALEN
. . . supt. of new IBM plant

J. J. LANGLOIS
. . . General Dry Batteries gen. sales mgr.

Corp., Salem, O. He succeeds **B. E. Kibbee**, retired.

William W. Kuyper was appointed manager-manufacturing engineering of **General Electric Co.'s** large steam turbine-generator department at Schenectady, N. Y. He joined GE in 1933 and has recently served the department as project engineer for the new turbine development laboratory.

Marshall B. Taft was named general manager, valve division, **Minneapolis-Honeywell Regulator Co.**, Philadelphia. He succeeds **Stephen A. Keller**, who was named general manager of the new Heiland Division of the company in Denver.

William Bennett was made supervisor in the up-state area of the hydraulic division of **J. N. Fauver Co. Inc.**, Detroit.

International Business Machines Corp. announces appointments for its Kingston, N. Y., plant now being built for defense production. **Richard J. Whalen** will be superintendent; **Paul F. Steinkuller**, personnel manager; **Carroll F. Lynch**, production engineer; **George S. Vermilyea**, manufacturing engineer; **Paul F. Heitz**, quality control manager; and **Frank G. Paul**, production manager.

Louis S. Kutscher was appointed sales manager for **Barnaby Mfg. Co.**, Bridgeport, Conn.

National Motor Bearing Co. Inc., Redwood City, Calif., appointed **V. L. Peickii** director of research and **A. W. McGuire** product manager for its National O-Rings.

Henry C. Stricker Jr. was promoted to chief engineer, **Highway Trailer Co.**, Edgerton, Wis.

J. J. Langlois was appointed general sales manager of **General Dry Batteries Inc.**, Cleveland. Before joining General he was national sales manager of the visible records division of Remington Rand Inc. at New York. In addition to supervising General's sales activities, Mr. Langlois will direct advertising and sales promotion programs.

Joseph W. Ferrara, warehouse superintendent, Cleveland plant, **Reliance Steel Division**, Detroit Steel Corp., was made acting plant manager. He succeeds **M. E. Kramer**.

C. D. Galloway Sr. joins **Chambersburg Engineering Co.**, Chambersburg, Pa., as impacter consultant. He was with Electric Storage Battery Co. for 34 years. When he retired in 1951, he was factory engineer for all plants.

OBITUARIES . . .

Thomas R. Navin, 64, one of the founders of **Detroit Bevel Gear Co.**, Detroit, and its president and general manager, died Sept. 30. He was also president and general manager of Republic Gear Co.

Robert Carnick, 73, board chairman, **Capco Steel & Engineering Co.**, Detroit, died Oct. 3.

George W. Mason, 63, president and chairman of **American Motors Corp.**, Detroit, died Oct. 8. Identified with the auto industry since 1913, he became head of American Motors (Nash and Hudson) upon its organization early this year.

Frederick A. Kraft, production manager, **Kay-Brunner Steel Products Inc.**, Alhambra, Calif., died Oct. 4.

Arthur J. Heindel, 61, sales representative for **United States Graphite Co.'s** foundry products for 41 years, died Sept. 19 at his home in Saginaw, Mich.

George P. Fisher, 65, who retired four years ago as vice president in charge of personnel, **Whiting Corp.**, Harvey, Ill., died Sept. 30.

William B. Petzold, 43, supervisor of design for **General Electric Co.'s** laminated and insulating products department at Chicago, died Sept. 25.

Richard L. Rossin, 46, a partner of **Stanat Mfg. Co.**, Long Island City, N. Y., died Sept. 24.

Borg-Warner Expands

Purchase of Weston Hydraulics extends its manufacturing operations to West Coast

INDUSTRIALIZATION of the Far West is continuing at a fast pace. Borg-Warner Corp., Chicago, is the latest major company to extend its manufacturing operations to that section of the country. Purchase of Weston Hydraulics Ltd., North Hollywood, Calif., marks Borg-Warner's "initial step leading toward even further expansion of our corporation's manufacturing activities on the West Coast," says Roy C. Ingersoll, president.

Weston Hydraulics designs and manufactures hydraulic and pneumatic equipment for the aircraft industry. It will be operated as a subsidiary, with Ira E. Weston continuing as president.

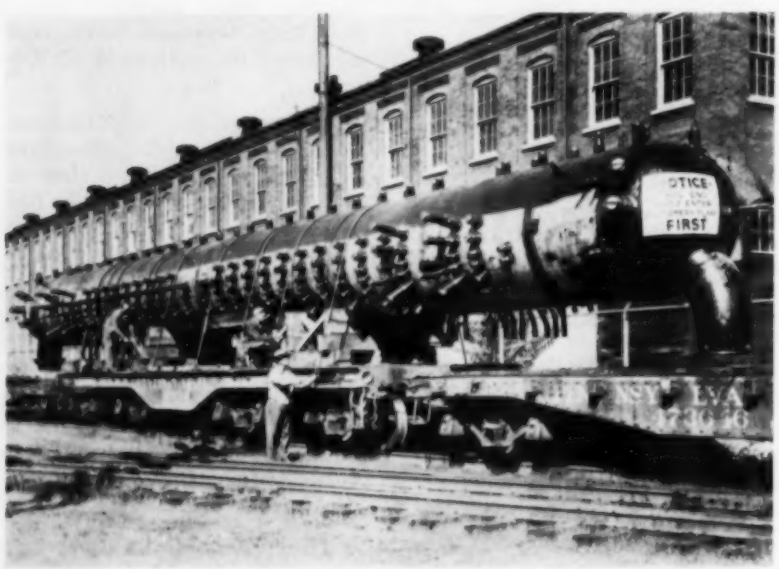
Borg-Warner is one of the nation's large producers of aviation equipment. Aircraft pumps and related accessories are manufactured by the firm's Pesco Products Division, Bedford, O.; Wooster Division, Wooster, O.; and Marvel-Schebler Products Division, Decatur, Ill. Borg-Warner also is a leading manufacturer of automotive and farm equipment components and household appliances. The corporation's 27 other plants and three specialty steel mills are in the Midwest, Midsouth and the East. The Petro-Mechanics Research Division was established two years ago in North Hollywood to test and perfect a sonic oil well drill.

Bristol Buys Accurate Brass

Accurate Brass Corp., a wholly owned subsidiary of Bristol Brass Corp., Bristol, Conn., purchased the assets and business of Accurate Brass Co. Inc., Glendale, N. Y. The latter is a large independent producer of brass and aluminum forgings.

Dravo Adds Sintering Equipment

Dravo Corp.'s Machinery Division, Pittsburgh, has added iron ore sintering and pelletizing equipment to its line of industrial machinery. The company has an exclusive licensing agreement with Lurgi Gesellschaft fur Chemie und Huttenwesen, M.B.H., Frankfurt, Germany. It will manufacture and market complete iron ore sintering and pelletizing plants for the ore and steel industries in the United States.



Big Power Package for Detroit

This 193-ton steam drum, built by Babcock & Wilcox Co., New York, at its Barberton, O., plant, is one of the most unusual welded pressure vessels ever fabricated. It is 82 ft long and required three railroad flat cars for its trip to Detroit. The drum is part of a giant boiler that will reach 15 stories in height when erected at River Rouge power plant of Detroit Edison Co.

PSC Buys Clearing Machine

Latest acquisition makes Pressed Steel Car Co. a major factor in machine tool industry

PRESSED STEEL CAR CO. INC., Pittsburgh, through purchase of Clearing Machine Corp., Chicago, becomes a major factor in the machine tool industry. It's the most significant addition the company has made to its growing list of diversified activities.

Product Line—Clearing Machine manufactures a full line of industrial presses. It claims 25 per cent of the nation's medium and large mechanical press sales, is one of the top suppliers of heavy hydraulic presses and a major factor in the manufacture of smaller open-back inclinable presses and accessories, such as die cushions, counter balance cylinders and attachments. The firm also is a leader in automation processes.

John I. Snyder Jr., chairman of the board and president of Pressed Steel Car, says his firm already is "a major manufacturer of engine lathes through our Axelson Mfg. Co. Division, Los Angeles, which we acquired two years ago. To these important machine tools, we can now add the full line of Clearing presses."

Pressed Steel Car acquires Clearing's total assets, including manufacturing plants in Chicago and Hamilton, O. Clearing will operate independently as a division. Present management will be retained.

Pressed Steel Car manufactures a widely diversified line of products, including petroleum pumping equipment, heavy-duty engine lathes, steel tanks, electrical conduit fittings, stainless steel cookware, dairy cans and equipment and waste receptacles. The company conducts an international export business in heavy equipment and machinery. It operates a large tank and armored vehicle depot at its Hegewisch, Ill., plant.

McKelvey Steel To Expand

McKelvey Steel Corp., Tulsa, Okla., plans to increase its mill capacity. The company specializes in structural, pipe and pressure vessel fabrication, hardsurfacing

any way you look at it . . .

SIMONDS

RESINOID BONDED
GRINDING WHEELS

with
RED STREAK
FLANGES
save
money
in
high speed
snagging

Tonnage ground! Wheel cost! Wheel life! From any cost-saving angle this wheel has it. Less wear on mount centers. Better balance, truer running for exceptionally fast stock removal. A Simonds exclusive for new efficiency on high speed snagging operations. Write for bulletin ESA-62.

Patented Red Streak flanges prevent chipping of wheel sides and edges at center hole.

SIMONDS
ABRASIVE CO.

PHILADELPHIA 37, PA.

BRANCH WAREHOUSES: BOSTON, DETROIT, CHICAGO, PORTLAND, SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

DIVISION OF SIMONDS SAW AND STEEL CO., FITCHBURG MASS. • OTHER SIMONDS COMPANIES: SIMONDS STEEL MILLS, LOCKPORT, N.Y., SIMONDS CANADA SAW CO., LTD., MONTREAL, QUEBEC AND SIMONDS CANADA ABRASIVE CO., LTD., ARVIDA, QUEBEC

BROWNHOIST

BUILDS BETTER HEAVY-DUTY MATERIALS HANDLING EQUIPMENT

ANNOUNCING AMERICA'S FIRST DIESEL ELECTRIC PILE DRIVER

The Industrial Brownhoist heavy-duty Diesel electric full revolving pile driver illustrated here is the first ever built. Maximum leader load is 26,000 lbs. Reach is 34' 1" from center of rotation and 20' 6" ahead of the front axle. Power battering leaders 50 feet long have a batter of 3 inches per foot. The leaders can be raised to driving position or lowered to traveling position in just one minute. Top travel speed is 20 m.p.h. with a maximum drawbar pull of 21,000 lbs. It can haul its own work train and is equipped with air brakes for braking the driver as well as the cars it is hauling.

Brownhoist also builds Diesel Electric Locomotive-Cranes in capacities from 25 tons up, Railroad Wrecking Cranes in capacities to 250 tons, boat unloaders, traveling bridge cranes, fast plants and other special equipment for handling bulk materials fast and efficiently in mines, railroads, docks and large manufacturing plants. For complete information about Brownhoist equipment to speed up your heavy materials handling, consult your nearest Brownhoist representative or write us today.

ANOTHER ADDITION TO THE FAMOUS BROWNHOIST FAMILY OF HEAVY-DUTY, TIME-SAVING EQUIPMENT

176

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

and reclamation of used flux. Officers include L. N. McKelvey, president; Leonard Haughton, general manager; L. N. McKelvey Jr.; chief engineer. Alfred B. Kern has been named sales representative.

Machinery Divisions United

Proctor & Schwartz Inc., Philadelphia, machinery manufacturer, consolidated its Drying Machinery and Textile Machinery divisions. H. B. Riehl is vice president in charge of sales; J. W. Powischill is head of the engineering department.

Birmingham To Get Warehouse

Molton, Allen & Williams, realtors, will erect a warehouse in Birmingham as part of the district's campaign for more distribution facilities. The warehouse, to cost more than $1 million, will contain some 225,000 sq ft. It will go up next to Ingalls Iron Works Co.

Garrett Buys Supply House

Garrett Corp., Los Angeles, purchased the Phoenix, Ariz., supply house of McConkey-Docker & Co. and will operate it as a branch company of its Garrett Supply Division. Henry Turner is manager of the Phoenix branch.

J&L To Build Container Plant

Jones & Laughlin Steel Corp., Pittsburgh, will build a new Container Division plant and office. It will adjoin its present plant at Sabine Highway No. 87, West Port Arthur, Tex.

Equipment used for producing steel drums will be moved into the 38,000-sq-ft building. The present 18,000-sq-ft plant will be used for warehouse space.

New equipment to be housed in the projected building will include a unit for cleaning and phosphatizing drums inside and out by the Jalizing process. Another new piece of equipment will be a paint baking oven, which will enable J&L to produce high-bake interior linings for the drums.

Steel sheet is the chief product used in producing the drums. It comes by barge 2239 miles from

(*Please turn to page* 84)

NATIONAL AIROIL

TYPE "SA"

STEAM ATOMIZING OIL BURNER

VIRTUALLY IMPOSSIBLE FOR ANYTHING TO CLOG OR GO WRONG . . .

. . . SEE FOR YOURSELF!

The popular NATIONAL AIROIL Steam Atomizing Oil Burner *thoroughly atomizes* and *completely burns* the lowest and cheapest grades of fuel oil or tar . . . requires only minimum supervision and maintenance. Only slight oil pressure and temperature is needed . . . and internal atomizing venturi feature assures a low steam consumption. NATIONAL AIROIL Type "SA" Oil Burner is adaptable to all types of industrial heating, power or process furnaces . . . is suitable for firing above stoker grates on conversion to oil.

Other "SA" modifications designed for: the burning of Colloidal fuel ("SAR") — Large capacity operation ("SAL")—Sludge burning ("SAD")—Combined steam and mechanical atomization (Dual Stage).

WRITE FOR BULLETIN 21

OIL BURNERS and GAS BURNERS for industrial power, process and heating purposes
STEAM ATOMIZING OIL BURNERS
SLUDGE BURNERS Steam Atomizing
MOTOR-DRIVEN ROTARY OIL BURNERS
MECHANICAL PRESSURE ATOMIZING OIL BURNERS
DUAL STAGE, Combining Steam and Mechanical Atomization
LOW AIR PRESSURE OIL BURNERS
NAIROIL AUTOMATIC OIL BURNERS, for small process furnaces and heating plants
GAS BURNERS
COMBINATION GAS & OIL BURNERS
FUEL OIL PUMPING and HEATING UNITS
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SPECIAL REFRACTORY SHAPES

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INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

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... a name that means

Complete, Integrated TECHNICAL SERVICE near as Your Telephone

A MODERN CONCEPT IN SERVICE GEARED TO TODAY'S COMPLEX INDUSTRIAL NEEDS

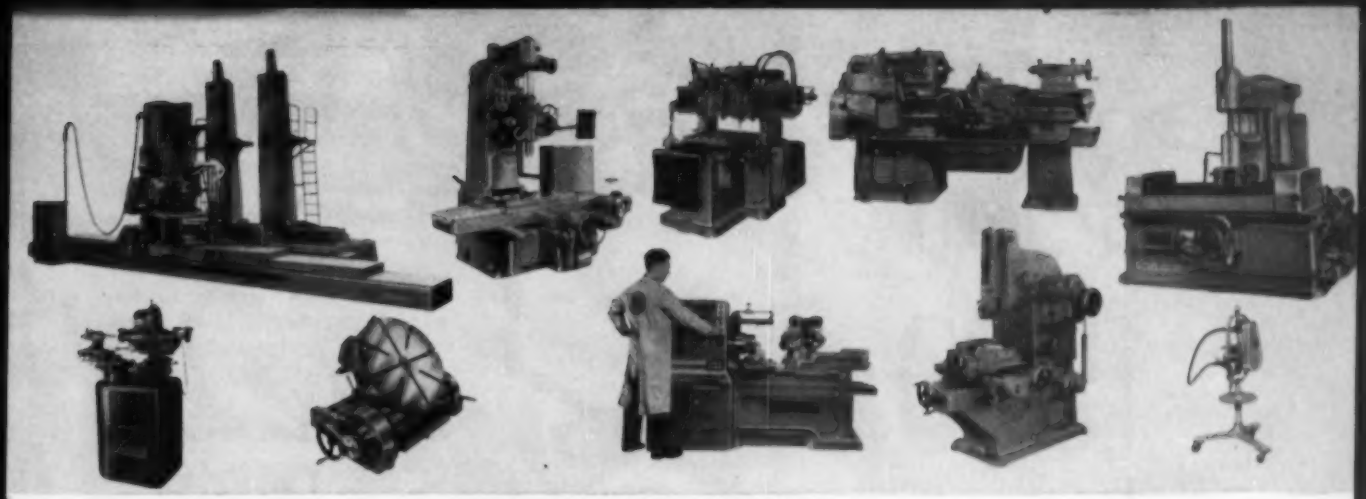
Including...

Comprehensive Local Stocks

Pratt & Whitney Branch Offices are strategically located in principal manufacturing areas throughout the country; there's one conveniently near you . . . if not right in your own city, it's at least as near as the phone on your desk and within quick shipping distance. The P & W Branch Office in your area makes it a point to become familiar with your needs and to carry comprehensive stocks of the Pratt & Whitney Cutting Tools and Gages you call for. You are saved time, expense and trouble of maintaining large inventories in your stock rooms. Where desired, deliveries can be geared to your production schedules.

Expert Engineering Assistance

The Pratt & Whitney Representative who calls on you is a factory-trained specialist fully experienced in everyday manufacturing problems. Here is a man who talks your language. In direct contact with the Pratt & Whitney Plant, he places a wealth of practical engineering information at your disposal. This P & W Specialist is thoroughly qualified to recommend the right equipment exactly suited to your specific needs from the complete P & W lines of Machine Tools, Cutting Tools and Gages. Why settle for less, when straight-line, factory-direct skill and knowledge is yours for the asking?



MACHINE TOOLS

Unique Combined Experience

MODERNIZE with PRATT & WHITNEY REPLACE FOR PROFIT

Manufacturing a complete line of Machine Tools, Cutting Tools and Gages, Pratt & Whitney possesses a unique combined experience and an unmatched ability to correlate all the varied and vitally interrelated problems of modern manufacturing. This position of superiority is manifested in the significant advances and improvements in Pratt & Whitney products . . . and in P & W's ability to serve you better *all ways!*

CUTTING TOOLS

GAGES

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DIVISION NILES-BEMENT-POND COMPANY
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SINCE 1860

First Choice P&W *for Accuracy*

BRANCH OFFICES AND STOCK . . . BIRMINGHAM* BOSTON • CHICAGO • CINCINNATI • CLEVELAND DALLAS (The Stanco Co.) • DETROIT • HOUSTON (The Stanco Co.) • LOS ANGELES • NEW YORK • PHILADELPHIA PITTSBURGH • ROCHESTER • SAN FRANCISCO ST. LOUIS • EXPORT DEPT., WEST HARTFORD
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There are over 1,500 chances

Over 200 ROUND STYLES produced

Over 1000 HEX STYLES produced

Over 100 SQUARE STYLES produced

Fischer has your SPECIAL SIZE in REGULAR production

If it isn't, FISCHER WILL CUSTOM PRODUCE IT at a price far below your present cost!

OVER 140 THREAD SIZES!

"Fischer Turned" BRASS NUTS

CHECK FISCHER! Find out if your special isn't a "standard". You'll find it pays! For either way, regular or custom production, you can't match the HIGH PRECISION, LOW PRICE and POSITIVE DELIVERY of "Fischer Turned" Brass Nuts. Our prices and samples will prove it. Send today!

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Western Union—TFI-BELL SYSTEM TELETYPEWRITER CI-448-U.
TELEPHONE Woodburn 1280

(*Concluded from page* 81)

J&L's mills in Pittsburgh and Aliquippa, Pa. Besides steel drums, the Container Division produces galvanized ware and steel shipping pails. Other plants of the Division are at Atlanta; Cleveland; Philadelphia; New Orleans; Bayonne, N. J.; Kansas City, Kans.; and Toledo, O. Division headquarters are in New York.

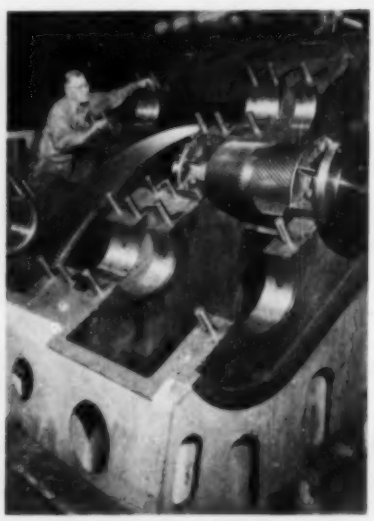
Dayton Firm Buys Alarm Line

Fyr-Fyter Co., Dayton, O., maker of fire extinguishers, charges and recharges, purchased Superior American Fire Alarm Division of Revere Corp. of America, Meriden, Conn. Equipment of the Connecticut firm will be moved to Wooster, O., where the Dayton firm has its Wooster Brass Division.

Tubing Firm Widens Service

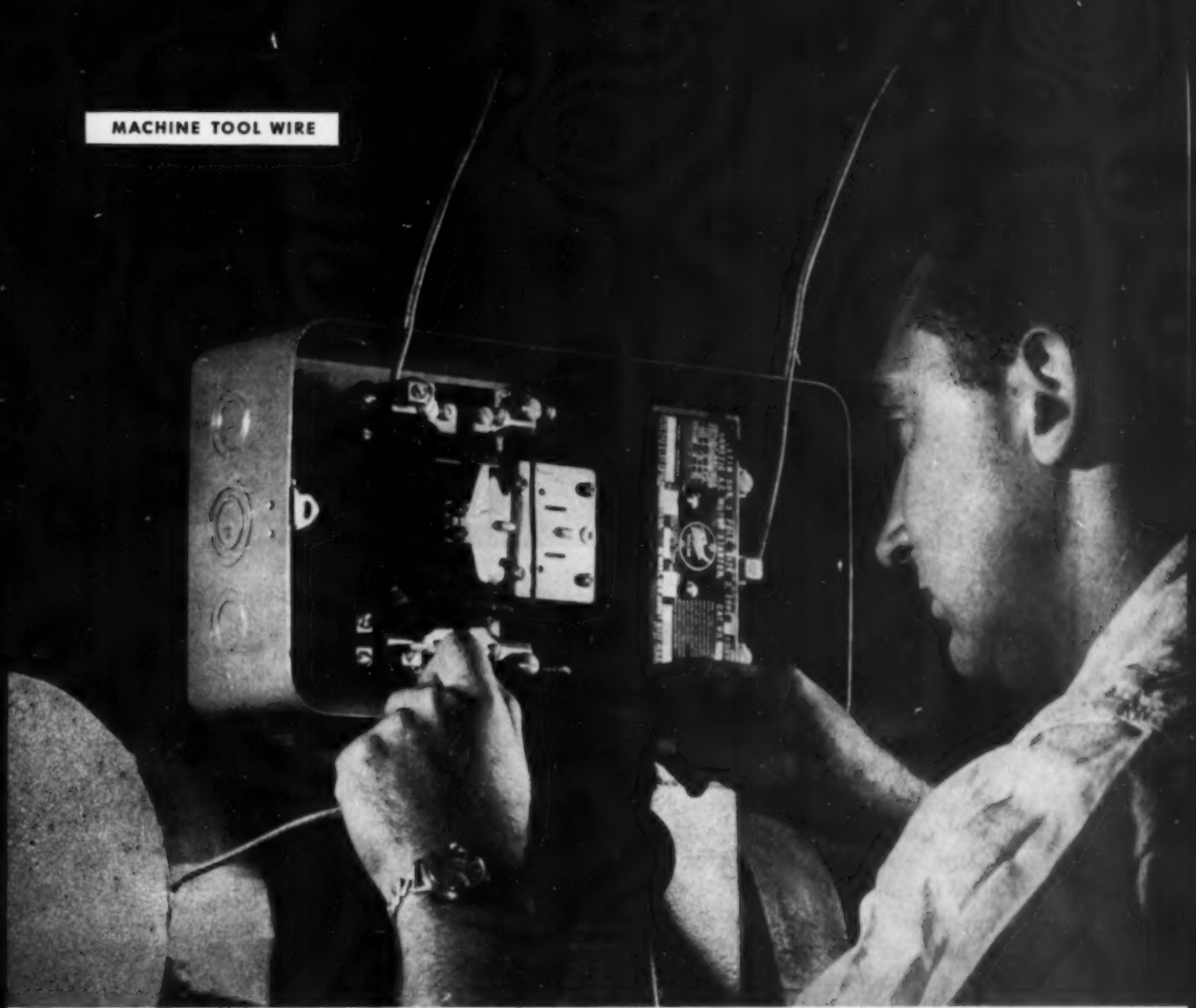
H & H Tube & Mfg. Co., Detroit, has broadened its services to include cold fabrication of welded and seamless steel and aluminum tubing. The company has been known for many years as a leading brass and copper redraw, re-

(*Please turn to page* 86)



Casting Will See Sea Duty

A worker at General Electric Co.'s Lynn, Mass., plant checks bearing seats of the gear casting that will hold the main propulsion gears of the *U. S. S. Saratoga*. This is part of a "line-up" done prior to test running the gears. These propulsion gears are similar to the equipment which GE will supply for the U. S. Navy's newest aircraft carrier, the CVA-62



ANACONDA MACHINE TOOL WIRE has a specially-compounded vinyl resin insulation . . . assures long dependable service . . . makes installation easy.

Are you profiting from all these advantages of plastic-insulated machine tool wire?

Insulation "makes" a machine tool wire. That's why Anaconda has engineered a *special* vinyl resin compound for the job. This dependable, long-lasting material—called Densheath*—resists every known enemy of machine tool wire.

Oil mist set up by a milling machine has no adverse effect on Densheath. Nor has vibration in a broaching machine . . . the coolant on a grinding machine . . . metallic dust and dirt around a lathe.

Densheath wire is slim, flexible. Its small size saves space. And it's easy to install: it strips clean with a knife; built-in, *permanent* color coding simplifies tracing.

Flame-resistant? Of course. It will not burn nor support combustion.

And its quality is typically Anaconda! The latest equipment, rigid product control, selected materials assure you of *uniform* high quality product with every order. To order, or for more information, call your Anaconda Salesman or Distributor. He can also give you full information on Anaconda control cable and portable cord that you may need. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 64222

*Reg. U. S. Pat. Off.

DENSHEATH
MACHINE TOOL WIRE
ANACONDA®

RESISTS OIL | RESISTS MOISTURE | STRIPS EASILY | FLEXIBLE | COLOR CODED

WHY WAIT MONTHS

FOR YOUR NEXT CRANE

For too many years, crane builders have made every order a "production". Weeks of extra engineering, custom built parts, and endless delivery delays have been standard fare for the buyer.

Fortunately, MICHIGAN CRANE is young enough not to have pet prejudices and experienced enough to produce excellent cranes at competitive prices and in a spectacularly short time.

For example, many plants have low clearances between the top of the crane runway and the lowest roof obstruction—which calls for a "low headroom" crane. Most manufacturers call in a troop of engineers for the job. But, because all Michigan cranes are designed for minimum headroom, chances are one of our standard models will fit—saving you weeks of waiting and considerable expense.

Give us a chance to prove it; write for Bulletin 154 to Michigan Crane & Conveyor Co., 114 N. McKinstry Avenue, Detroit 9, Michigan.

MICHIGAN

Crane & Conveyor Company

(*Concluded from page 84*)

roll and fabricating mill. C. H. Higgins is president.

Edgcomb Steel Changes Name

Edgcomb Steel Corp., Hillside, N. J., distributor of steel and aluminum, changed its name to Edgcomb Steel & Aluminum Corp. The new title is in recognition of the tremendous growth in the firm's sales of aluminum since it added the light metal to its line in 1947, officials explain. They also point out that sales of stainless, tool, carbon steels and steel specialties have shown healthy growth.

GE Schedules Plant Opening

Official opening of General Electric Co.'s welding products plant at York, Pa., will be on Oct. 21. Formerly located at Fitchburg, Mass., the welding department moved its entire manufacturing and administrative facilities to York last January.

Canadian Drawn Steel Capacity

Canadian Drawn Steel Co. Ltd., Hamilton, Ont., produces nearly 25 per cent of Canada's cold-finished steel bars. This figure was not included in the steel industry's statistics, compiled by American Iron & Steel Institute, New York, which were published in the Sept. 20 issue of STEEL. Canadian Drawn Steel Co. can produce 30,000 tons of cold-finished bars a year. Other companies in Canada have an aggregate capacity of 95,000 tons.

Casting Service Broadened

Installation of high-speed machinery and the addition of enlarged foundry facilities have enabled American Hoist & Derrick Co., St. Paul, to furnish casting service to general industrial users. The company, in addition to pouring standardized castings up to 6 tons in steel and up to 10 tons in iron, offers the services of a team of engineers, metallurgists and foundry specialists.

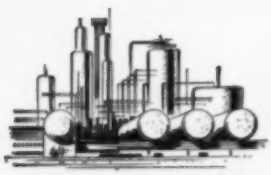
Heading up the sales end of the new division is J. D. Johnson, formerly director of foundry research for Archer Daniels Midland Co., Minneapolis. H. M. Patton is in

The Case For Alloy Steels!

Carbon steels are better today than ever before. A major producer of both carbon and alloy steels, Republic is aware of this fact. Even so, there are limits to the application of carbon steels. Machine design may restrict the size of a part. High strength may be an essential combination with light weight. Sometimes surface hardness and ductility must be held within the limits. Such are the applications in which *only* alloy steels can perform definite tasks with certainty of results at lower ultimate cost.

Take large sections—where hardness must be carried deep into the steel. Heavy crankshafts, connecting rods, piston rods, large gear and axles are examples. Here alloy steels *are necessary*, and the cost low in proportion to results. With carbon held constant, depth-hardening quality increases as the alloy content is increased.

Sometimes weight and space limitations demand that smaller sections carry heavier loads safely. For safety's sake, the answer *must be* alloy steels. Under repeated stress, high tensile strength and hardness do not necessarily indicate high fatigue properties. The load-carrying ability of a steel depends upon its alloy constituents and the form of the structure at the time it is bearing the load.



A problem of high pressures at elevated temperatures may present a problem. But alloy steels *have proved* their high resistance to creep. Some stainless alloys maintain high strength up to 1800° F. They resist oxidation—therefore do not lose their strength appreciably through reduction of section.

High elastic properties and strength may be the primary requirement, especially for welded structures. Weight reduction may be most important. In these applications, low carbon complex alloy steels *offer distinct advantages*. Such alloy steels at equal or higher yield points show low weld-hardening tendencies. Resistance to corrosion is improved. So is ductility of the weld. And retention of toughness at sub-zero temperatures, as well as creep resistance at high temperatures, is better.

To help you get the most from alloy steels, Republic offers you its unique 3-D Metallurgical Service. You benefit from the combined experience and coordinated efforts of three groups of highly-trained men—(1) the Republic Field Metallurgists; (2) the Republic Laboratory Metallurgists; (3) the Republic Mill Metallurgists. All work hand-in-hand to help you do the job you want done with alloy steels at the lowest possible cost. Ask us about this service.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Bldg., New York 17, N.Y.

REPUBLIC ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Bars, Wire, Pig Iron, Steel and Plastic Pipe, Bolts and Nuts, Tubing

charge of custom casting production. Under Mr. Patton's direction, the company's foundry facilities have been completely revamped and mechanized.

Newage Opens Toronto Plant

Newage (Canada) Ltd., Toronto, Ont., subsidiary of Newage International Inc., New York, opened its headquarters in Toronto. Main sales and service divisions are in the machine tool field (portable metal hardness tester, turbine air grinder and universal Rindis machine tool); electrical, pump and engine field; and materials handling (products of the Austin Crompton Parkinson Group from England).

Equipment Maker Licenses Firm

Furnaces and heat-treating equipment of Pacific Scientific Co., Los Angeles, will be manufactured for eastern markets under a licensing agreement with Case Hardening Service Co., Cleveland.

Austin To Build Engine Plant

Fairchild Engine & Airplane Corp., New York, selected Austin Co., Cleveland, as designer and builder of a multimillion-dollar main Engine Division plant and turbine test laboratory at Deer Park, Long Island, N. Y. The structure, covering over 80 acres, will have more than 400,000 sq ft of working area. It will replace the 424,000-sq-ft Farmingdale factory, which is occupied by Fairchild Engine Division, recently sold to Republic Aviation Corp., Farmingdale.

Perkin-Elmer Forms Division

Perkin-Elmer Corp., Norwalk, Conn., manufacturer of scientific instruments and precision optics, formed Vernistat Division. Eugene W. Dunstan was named general manager. The new unit will develop, manufacture and sell a new type precision variable-ratio transformer. It is designed for use in servo systems and analog computers. Separate quarters for production operations eventually will be established in the vicinity of Norwalk.

ASSOCIATIONS

Paul R. Hafer, president, Boyertown Auto Body Works Inc., Boyertown, Pa., was elected president of **Truck Body & Equipment Association Inc.**, Washington. Other officers are: W. F. Lacey Jr., W. F. Lacey & Sons, Medford, Mass., first vice president; Dudley V. Walker, Everhard Mfg. Co., Cleveland, second vice president; F. S. Meeks, secretary-treasurer.

Glenn A. Hutt, vice president, Ferro Corp., Cleveland, is the new president of the **Porcelain Enamel Institute,** Washington.

Vice presidents elected at PEI's annual meeting are: J. E. Bourland, Texlite Inc., Dallas; J. L. Hodgkinson, U. S. Porcelain Enamel Co., Los Angeles; D. H. Malcom, Armco Steel Corp., Middletown, O.; H. McE. Patton, Ingram - Richardson Mfg. Co., Beaver Falls, Pa.; R. N. Smith, Temco Inc., Nashville, Tenn.; Y. C. Smith, AllianceWare Inc., Alliance, O.; and Herbert Turk, Pemco Corp., Baltimore.

GLENN A. HUTT
. . . heads Porcelain Enamel Institute

P. B. McBride, Porcelain Metals Corp., Louisville, was re-elected treasurer; Edward Mackasek, managing director; and John C. Oliver, secretary. W. A. Barrows, Barrows Porcelain Enamel Co., Cincinnati, immediate past president, remains on the executive committee.

Marion N. Kershner of Armco Steel Corp., Middletown, O., was named president of **National Association of Foremen,** Dayton, O. John T. Beatty, president of United Specialties Co., Chicago, was named the top American industrial executive for 1954 by the association.

Earl Bunting resigned as managing director of **National Association of Manufacturers,** New York, effective Dec. 31. Pending appointment of a successor, Kenneth R. Miller, senior vice president, will assume chief administrative responsibility.

NEW ADDRESSES

Assembly Products Inc., builder of moving coil relays, is moving operations to a plant at the intersection of County Line road and Wilson Mills road in Chesterland, O. The firm expects to be moved by Nov. 1.

REPRESENTATIVES

Allis-Chalmers Mfg. Co., Milwaukee, named Blair Electric Service Co., Altoona, Pa., as a certified service shop for its transformers. Blair will specialize in core and coil units for transformers.

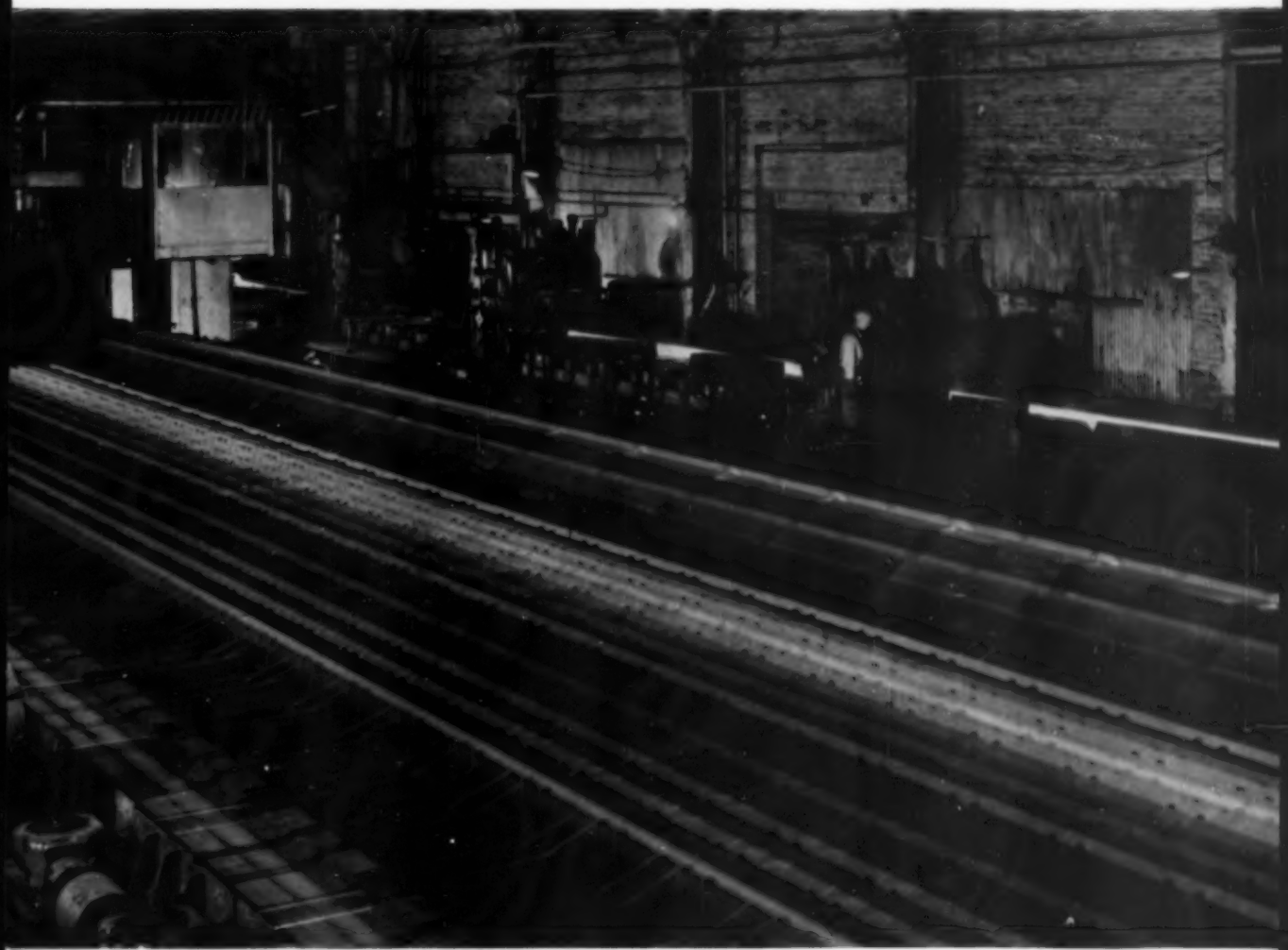
U. S. Rubber Co., New York, appointed Frederic B. Stevens Inc., Detroit, as national distributor to the metal finishing industry in the United States and Canada for Uscolite, a new thermo-plastic for piping, fittings and valves.

Dow Chemical Co., Midland, Mich., appointed Corrosion Services Inc., Tulsa, Okla., as a distributor for its magnesium anodes, cathodic protection equipment and instruments.

Electric Regulator Corp., Norwalk, Conn., appointed Engineering Specialties, Madeira, O., as a sales representative.

CONTINENTAL

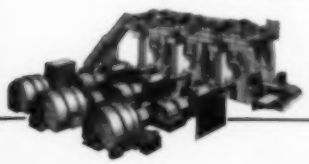
MERCHANT BAR MILL



How to Insure Performance When You Build a Rolling Mill

The definite and predictable performance of Continental Rolling Mills is a result of Continental's highly integrated organization and facilities. Under a single management you are served by competent engineers and designers—by complete facilities for producing every component—for assembling and testing—plus field installation that ends only when expected mill performance is a reality. More and more steel leaders are looking to Continental's complete service and undivided responsibility for their best assurance when building a mill.

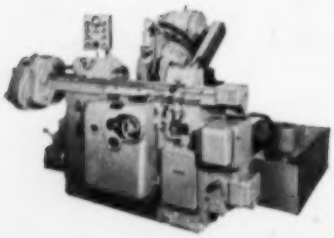
- COMPLETE ROLLING MILLS
- ROLLS • ROLL LATHES
- CONTINENTAL CHIPPER
- SPECIAL MACHINERY
- STEEL CASTINGS • WELDMENTS
- COPES-VULCAN BOILER CONTROLS AND CLEANING



Plants at
East Chicago, Ind. • Wheeling, W. Va. • Pittsburgh, Pa.
Copes-Vulcan Division, Erie, Pa.

CONTINENTAL
Foundry & Machine
Company

CHICAGO • PITTSBURGH



YOUR CHOICE OF 3 METHODS FOR ACQUIRING NEW MACHINE TOOLS ON A SOUND BASIS

Jones & Lamson Machine Company now offers a 3-way marketing service to users of high-efficiency metal-cutting tools. This service, initiated by J&L after intensive study, covers every need and clears up all confusion on the problem: to lease or not to lease. You may buy outright . . . buy on a 1-to-5 year basis, at interest rates as low as 3¼%*. . . or you may lease on any of 4 variations of a rental plan. Write or phone Jones & Lamson Machine Company for full information and dependable advice.

*(add-on rate)

JONES & LAMSON MACHINE CO.
517 Clinton St., Springfield, Vermont, U.S.A.

UNIVERSAL TURRET LATHES • FAY AUTOMATIC LATHES • AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES
AUTOMATIC THREAD & FORM GRINDERS • OPTICAL COMPARATORS • AUTOMATIC OPENING THREADING DIES & CHASERS

Technical Outlook

NEW LIGHT— How much does it cost to vacuum melt metals? It's not the $4-to-$5-a-pound figure that sometimes is talked about loosely, says G. J. Crites, F. J. Stokes Machine Co. Metal can be processed in a 1000-lb vacuum induction furnace (2 million lb a year) for 12 cents a lb. Comparable operation without vacuum is about 6 cents a lb. Crites told the Electrochemical Society meeting in Boston recently that vacuum processing costs are often associated with small laboratory furnaces that have high overhead.

HYDROGEN IN TITANIUM— Another note from the Electrochemical Society meeting: T. D. McKinley, Du Pont Co., gave details for rapid determination of hydrogen in titanium based on measurement of the equilibrium pressure of the gas over the metal in a closed system. Range: 0.001 to 0.33 weight per cent. Twenty analyses can be made in an 8-hour day. Hydrogen content is important in melting, fabrication and final use of titanium.

STUDS UNLIMITED— Nelson Stud Welding Division of Gregory Industries, Lorain, O., sees advantages in hanging slabs in a furnace instead of pushing them in on a car. They're working on stud welding equipment for the 1½ to 2-in. studs needed to do the job.

HOT SPINNING—Kennametal Inc. claims great lasting powers for its sintered titanium carbide (Kentanium) when used for hot spinning tools. Company cites the example of a Kentanium tool, used to spin the ends of heated steel tubing at 600 rpm, which lasted 30 times as long as conventional tungsten carbide tools.

NICKEL EASE-UP— Nickel pinch under full mobilization appears to have been eased substantially by development of ways to knock it out of its three big military applications: Armor, armor-piercing projectiles and big gun barrels. In addition to know-how, nickel ease-up will depend on more heat treating equipment, heat treating controls and a much greater reliance on molybdenum.

APPROVED— Carpenter Steel Co.'s stainless No. 20 Cb plates, tubing, bars and forgings has been approved by the American Society of Mechanical Engineers for use in welded construction. The Boiler Code Committee set forth nine requirements for its use in welded pressure vessels—designated ASME Case 1188.

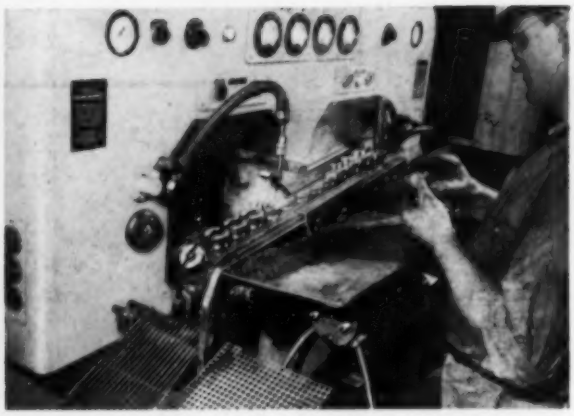
SAFETY FLUID— Nonflammable hydraulic fluid is quenching a fire hazard at many plants. Hydraulic systems near furnaces and welding equipment aren't the only places it's called for. A broken hydraulic line can squirt fluid 40 ft.

SAVING IN SAND— An overhead sand handling system which serves six molders at Superior Brass Works, Inc., Detroit, flies in the face of tradition which declares ten molders as the lower economic limit for such a system. This system disproves tradition with lower labor costs, closer tolerances and greater productive capacity.

ROBOT TESTER—A portable electronic test system that makes it possible to estimate the effect of adding new equipment to an industrial operation without actually installing it has been announced by Industrial Division of Minneapolis-Honeywell Regulator Co., Philadelphia. The system, called a servo analyzer, records the behavior characteristics of a piece of equipment and then shows how such behavior would affect the over-all behavior of an operation using the equipment.

Metalworking Outlook—p. 41 *Market Outlook—p. 147*

Two induction machines harden 500 to 900 gears an hour each at International Harvester's Louisville tractor works. A Westinghouse 200-kw rf generator does the job. Rejects amount to only 1/10 of one per cent



International Harvester uses a Tocco machine to selective harden 600 special transmission nuts an hour. Only the contact surfaces are hardened. The bottom channel must remain soft or the part will crack

No. 10 in STEEL's

MODERN HEAT TREATING SERIES

Induction Heat Treating...

Selectivity Teams up with Versatility

Production line machines harden, temper or stress relieve parts of almost every shape and size. Fast heating gives no scale, minimizes distortion and leaves core properties unchanged

SELECTIVE HARDENING uses high frequency induction to localize heat in a selected area, which is cooled faster than the critical rate to give the part a hardened case.

Counterpart of hardening is annealing. And induction heating is doing a pushbutton job here, too—in tempering, normalizing, stress relieving and drawing.

Induction heat treats parts as small as a dime and as large as a car wheel. It's doing a job on tappets, tappet bodies, pump shafts, axle shafts, crankshafts, shot bodies, cartridge cases, cylinder liners, gears, sprockets, valves and literally hundreds of other parts of every shape and size.

Markings—The short austenitization period is one of two main features of induction hardening. With furnace hardening, minutes or hours are the rule. Second feature is skin heating, where the surface is heated faster than the core. Parts can be surface hardened without carburizing them first.

For through-hardening, energy is put in at a lower rate; it's allowed to penetrate deeper for a uniform temperature before quenching.

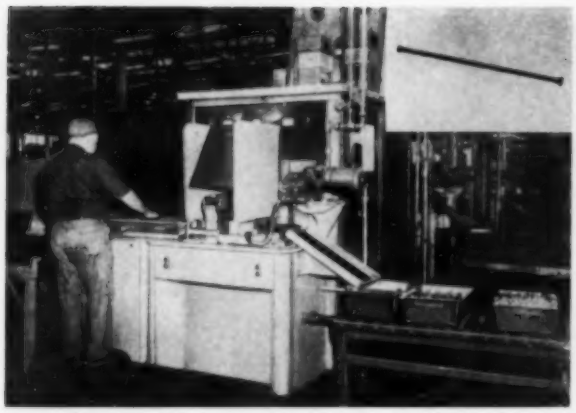
In annealing, induction gives accurate control of grain size and tensile properties.

But heat treaters agree that it is in hardening that the metallurgical plus of induction really comes out. Hardness can be put exactly where it's needed. Full hardness is uniform through 80 per cent of the hardened zone and falls off gradually in the area of demarcation between the case and the core.

Impetus—One big push back of induction hardening is modern design. It calls for more precise physical properties in steel components—accurate control of hardened areas (depth, width, location) and degree of hardness.

There's a never-ending reach for higher weight-horsepower ratio, lower material costs and more durability. Space limitations on functional parts demand more strength and fatique life per pound.

More Reasons—Another big factor is management's drive to eliminate heat treating "overhead." It wants to put heat treating



Automobile valve tappet pushrods (inset) are induction hardened for wear resistance using this Lindberg Engineering Co. equipment. Both ends are hardened simultaneously at rate of 51 pieces per minute with one operator. Steel used is type AISI-C1040

"Why heat whole piece?" was philosophy back of this General Electric installation to heat treat an aircraft gun part. Part (inset) was finished first, then only area shown was hardened. Induction kept accuracy and tolerances over irregular cross section

right in the production line to do away with back-and-forth handling costs. It wants to do the heating fast. Not only just to get the production out but to eliminate scale, minimize distortion and leave core properties unchanged.

Before induction came on the scene, track pins were of alloy steel and carburized with the usual machining and grinding operations. Material now used is cheaper SAE 1050 of turned and polished mill stock.

The case speaks for itself. It is another reason why more and more manufacturers are looking in the direction of induction. It's a part of their drive to cut materials cost to the bone.

Bonus Too—Sometimes you actually end up with a better part by going to a lower hardenability plain carbon steel. The carbon types can be quenched out and tempered to the desired core strength. Then the bearing surfaces can be hardened to what is needed for wear and fatique properties. Case depth can be made to suit the service.

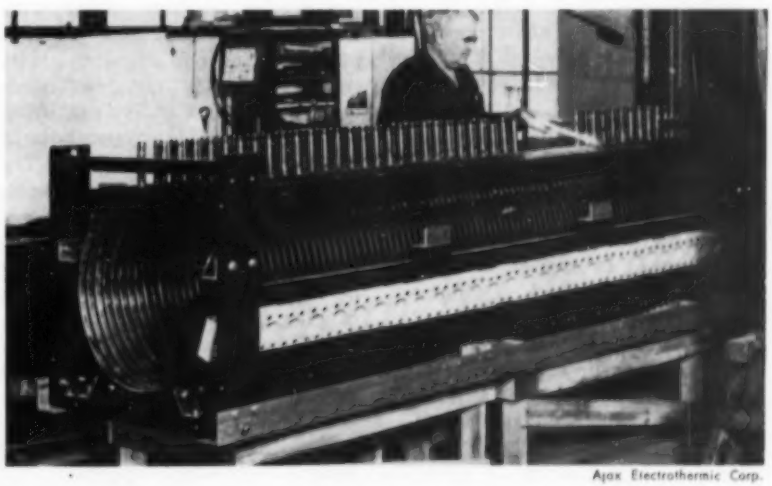
Induction gives high hardness on tooth profiles of medium carbon gears, while keeping high core strength for impact and fatigue resistance.

Alloy steels are used, too, especially where deep hardened cases are needed with good core properties.

As an example: The part is hardened and tempered to the needed core property; then the wear surface is hardened.

Ground Rule—In general, any metal that will harden upon heating and cooling can be handled by induction. Both heating and quenching cycles are regulated automatically by pre-set control. A new device has been developed that literally sights between the induction coils and measures surface temperature with a response time of 0.1 second.

Steel must have a carbon content of 0.20 per cent and up to harden. As carbon increases, hardness goes up as shown by the fol-



Ajax Electrothermic Corp.

This Ajax-Northrup induction heating coil (one of largest made--2 ft I.D. by 12 ft long) is used to surface harden rolling mill rolls. It can handle rolls from a few feet long to the full length of coil and has sight holes at regular intervals for inspection of skin temperature

INDUCTION HEATING AT WORK

HARDENING SHIFTING LEVER

Automatic heating cycle is 4 sec, quenching cycle is 2 sec; production 600 parts per hour on Tocco machine. This is one of 139 induction hardened parts at Baldwin-Lima-Hamilton Corp.

ANNEALING STAINLESS STEEL

Operator places formed stainless pot against guides on this Allis-Chalmers machine, and pushes button. Heat is automatically applied for proper time. One man anneals 350 pots an hour for less than 0.2 cents each

HARDENING TROLLEY WHEELS

Trolley wheels for overhead conveyors get heavy wear and are called upon for extreme service. This Tocco machine hardens wear surface only, leaves original toughness and ductility in rest of the part

lowing figures based on a water quench.

Carbon Per cent	Hardness Max. Rc
0.20	49
0.25	53
0.30	56
0.35	58
0.40	60
0.45	62
0.50	64
0.60	66
0.70	66
0.80	66
1.00	66

Low carbon steels with carburized cases, medium and high carbon steels, and both plain and alloyed cast irons are handled on the production line.

How it Works—High frequency alternating current passes through an inductor. It creates a simple transformer circuit in relation to the part. The inductor is the primary; the part is the secondary.

For a given surface temperature, the depth of heating and depth of hardening are dependent upon frequency, heating time and power density (kw per sq in. of surface area). The higher the frequency, the shallower the depth; the longer the heating time, the greater the depth. The higher the power density, the shorter the heating time and the shallower the depth.

Rule—For surface hardening, induction heating equipment people have standardized frequencies:

Frequency Cycles per sec.	Approx. min. practical depth inches
3000	0.060
9600	0.040
450,000	0.020

In production these depth values are rarely achieved except with material that has been given a prior heat, quench and draw. Heat treaters will tell you that hardness depths generally run from 0.050 to 0.150 in. regardless of frequency. Variables include: The material, its prior heat treatment, if any, its physical dimensions, configuration and power density.

A number of electronic heater manufacturers turn out heaters ranging from a few hundred watts to 100 kw or more, with frequency ranges of 300 kc to 27 meg. As the range of operating frequency increases, power output ratings tend to decrease, and applications become increasingly specific.

More Than One—Getting back to heat treating "overhead," induction people are quick to point out applications where multiple savings come into the picture.

Take the case of a saddle clamp eccentric. It's a hidden part in a milling machine, but one needing strength and wear resistance. Former method of processing included heat treating, straightening and cleaning. Cost was $1.57 a part.

Then induction heating was tried. Straightening and cleaning were eliminated. Heat treating cost was reduced to 10 cents a part. A switch was made from alloy steel to SAE 1045 for an added saving of 10 cents a piece.

Tractor Parts — International Harvester Co.'s Louisville Tractor works uses induction to process 26 parts. Equipment (Westinghouse) includes: Two 150 kw, 10,000 cycle motor generator sets, two 200 kw, 450 kc radio frequency generators, four 20 kw, 450 kc rf generators and one 50 kw, 450 kc rf generator.

Two gear machines are used alternately. As one is being set up the other is in production. Up to 900 gears an hour per machine are hardened. Slowest rate is 500 gears an hour. This is on a small cluster gear where the limiting factor is preheat power.

Fast and Sure—Induction fits

HARDENING ROCKER ARM PADS

This machine built by Weltronic Induction Heating Corp. hardens automobile rocker arm pads at the rate of 1800 per hour. A continuous conveyor carries parts through the heating coil and into the quench

SELECTIVE ANNEALING GEARS

Tool breakage is stopped by annealing the portion of the part to be machined. Induction localizes annealing so as not to disturb previous hardening. Heating time for this operation is 2 seconds

in well with production automation. Here's how it works at International's Louisville plant on the gears mentioned above. The operator places a green gear in a tray that is part of an indexing endless conveyor. The gear is indexed to a position over a spindle, which raises and rotates it in a 150 kw, 10,000 cycle preheat inductor coil.

Following this first preheat, the spindle then lowers, replaces the gear in the tray and the tray indexes to the second preheat station. The gear is preheated here, then goes to a third preheat station.

Final—It then goes to the high power radio frequency contour heating station, heated and indexed to the fifth and final station, where it is quenched. Part is removed as a properly contour hardened gear.

Heat treat scrap rate is 0.2 to 0.3 per cent—said to be 10 times below the gear industry general level. Common operations, such as grinding the hub face and size broaching and spline, are not needed.

Another tractor manufacturer uses straight 10,000 cycle induction to surface harden some 20 different transmission gears, (cluster and clashing-type) and internal bearing races, which must be contour hardened. Here, dual frequency (10,000 cycle preheat plus rf finish) is used only on a few fine pitch gears.

No Interference—Selective hardening of mower blades with induction gives needed hardness on the cutting edge only. Rest of the blade stays soft, so it can be riveted to the cutter without stress and consequent breakage.

In this case the operator simply loads the parts in a vertical magazine. A crank and cross head mechanism delivers the parts individually from the bottom of the magazine into the inductor coil for heating. As each blade is pushed from the magazine into the coil it forces the preceding blank from the coil into the quench tank.

Parts are hardened at 3000 an hour. Then a conveyor removes them from the quench tank for delivery to and through a draw furnace automatically.

Higher Level—A further accent on automation is a new process, which combines machining and heat treating in one operation. Developers of the process (Tocco) say: "In almost every instance where a part is now produced, or can be produced, on a multiple spindle automatic that requires selective heat treating, this technique can be applied. It is only necessary to reserve one spindle on the automatic for the heat treating operation."

The surface treated may be either internal or external. An example of the latter is a vane pump shaft; the former, an automobile trunnion cup. SAE-1144 steel is generally used.

If you look into the future of this development you see bars fed into a machine with completely machined and heat treated parts discharged from the final station.

More Automation—An automated fixture (Weltronic Induction Heating Corp.) hardens eight selective areas on an auto rocker arm shaft. Shafts are first gas carburized to depth of 0.030 in., slow cooled and roll straightened. They are then fed automatically and rotated through induction heating coils, where two areas are hardened simultaneously. Parts are ejected from the fixture to a conveyor, which carries it to the next operation.

Automotive starter ring gears are hardened automatically. Ring gears are loaded into the dual fixtures' loading magazine by conveyors that carry parts from the previous brush operation.

From there, part is picked up by the spindle locator, which carries it into the induction heating coil. There part is rotated, heated and quenched and then lowered to where it is stripped off and fed into a device which automatically reloads it onto a conveyor that takes it to the next operation.

PREVIOUS ARTICLES IN STEEL'S MODERN HEAT TREATING SERIES

No. 1—Let Modern Heat Treatment . . Turn on the Heat to Turn Down Your Costs—March 29, p. 102.

No. 2—Fundamentals of Heat Treatment—Part I, May 17, p. 102; Part II, May 24, p. 98.

No. 3—Fundamentals of Quenching—Part I June 7, p. 110; Part II, June 14, p. 114; Part III, June 21, p.128.

No. 4—Below Zero Heat Treatment—June 28, p. 104.

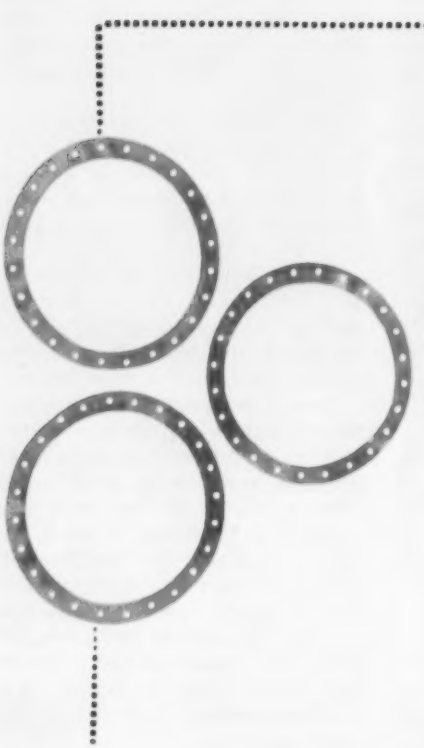
No. 5—Case Hardening Steel by Carburizing—July 5, p. 62.

No. 6—Case Hardening Steel by Carbonitriding—July 26, p. 98.

No. 7—Case Hardening Steel by Nitriding—August 9, p. 96.

No. 8—Salt Bath Heat Treating . . Old Process With New Ideas—Aug. 30, p. 68.

No. 9—Selective Hardening by Flame Heating—Sept. 27, p. 96.



How To Drill and Rivet Titanium

Slow spindle speeds, heavy feed and special drill design are best for making the holes. Hot formed riveting is best, but cold forming will work if pressure is over 5000 lb

By THOMAS A. DICKINSON
Los Angeles

TESTS recently completed by Ryan Aeronautical Co. at San Diego, Calif., (STEEL, Oct. 4, p. 94) show that titanium sheet stock can be satisfactorily drilled and riveted if adequate tools and procedures are employed.

Drill tests, for example, showed that spindle speeds as slow as 15 to 20 surface feet per minute were necessary to avoid excessive drill heating and that heavy feeds (of about 0.002 to 0.005 in. per revolution) were required to minimize work hardening.

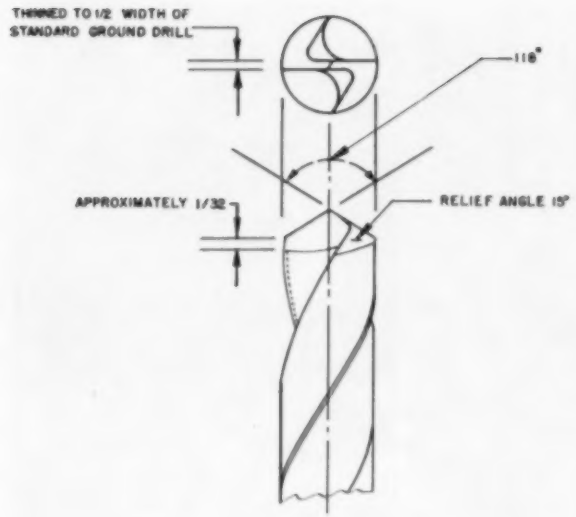
Different Drills—The drills used with best results had included angles of 118 degrees with relief angles of 15 degrees and were thinned down as shown in an accompanying diagram. They are quite different from the drills reportedly being used by other aircraft manufacturers in work with titanium. Their use is noteworthy to the extent that they appear to be exceptionally long-lived.

For instance, one drill was used to produce more than 1200 quarter-inch holes in 0.037 Ti-75A without a cooling medium before its cutting edge evidenced a slight degree of dulling.

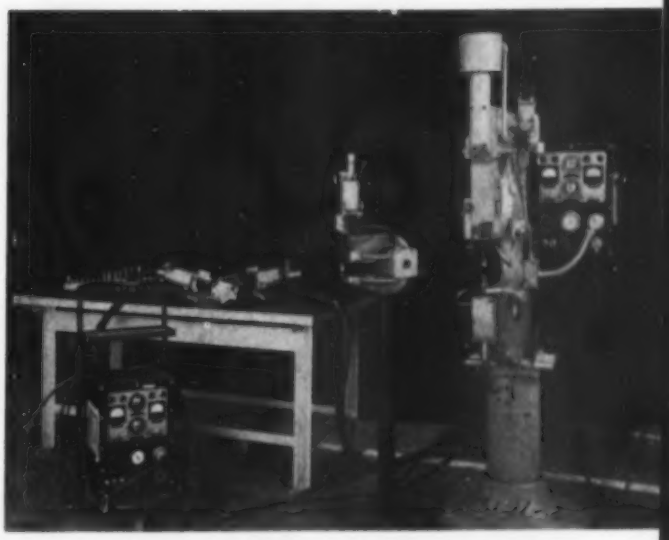
Ryan engineers do not maintain that drills of the type in question will give the best possible results in work with every conceivable titanium product, but they do believe the drills will give good results in work with virtually all types of titanium sheet stock.

Cold-Formed Rivets—Initial efforts to cold form titanium (Ti-75A) rivets were generally unsatisfactory because the rivets either cracked or failed to swell enough to fill their holes, but subsequent tests indicated that available titanium rivets could be satisfactorily cold formed with machine tools exerting 5000 or more pounds of pressure. For example:

(1) Ti-75A, ⅛-in-diameter flush rivets were adequately



Experience at Ryan has shown that the slow speeds and heavy feeds are essential to drilling of titanium. Above drawing shows details of special drill bit used



Tests prove that both portable and stationary squeezers can be used for riveting titanium. The units which have integrally heated dies produce the best results

cold formed with a tensile testing machine delivering 0 to 5000 lb of pressure for a period of about one second. Upset length of each rivet amounted to one diameter.

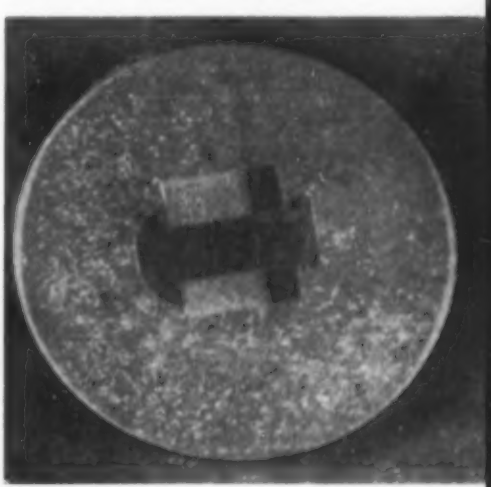
(2) Ti-75A, ⅛-in. diameter button head rivets (which had been annealed 20 minutes at 1300° F) were cold formed with a tip pressure of 5100 lb and a one-cycle squeeze in a squeeze-type riveting machine without undesirable cracking or inadequate swelling. Again, the upset length of each rivet was one diameter.

Test Results—A series of shear tests, made with 24 rivets formed as indicated above, produced the results shown in the table. Asterisks in the table below denote specimens in which cracks were observed.

Hot Formed Better—Much better results were obtained where titanium rivets were hot formed. A typical hot-forming setup involved use of a No. 59 Federal spotwelder equipped with Elkalloy A electrodes with ⅛-in. spherical radius counterbored faces. It was used to drive Ti-75A, ⅛-in. diameter rivets in 0.128-in. holes in 0.72 and 0.18-in. sheet stock.

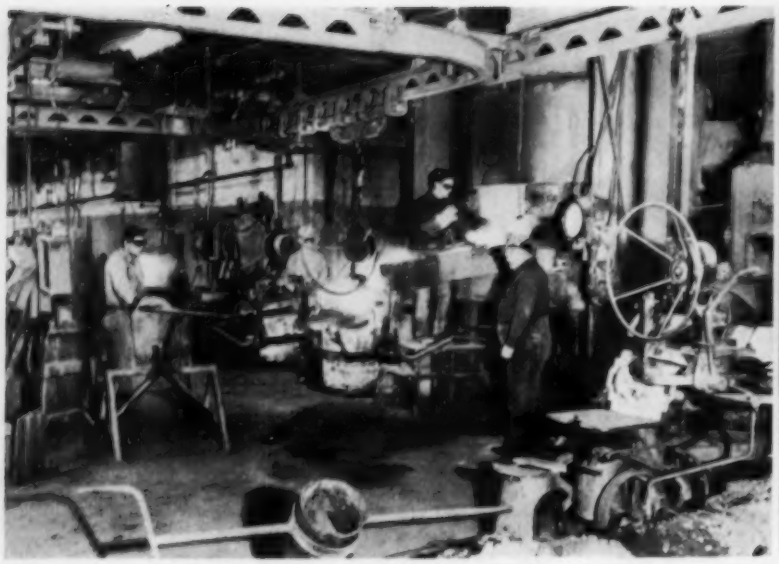
Good swelling and no cracks were observed where rivets had been formed with the spotwelder adjusted for three cycles of slope control at 35 per cent heat, five cycles of weld time at 52 per cent heat, and a transformer setting of four.

Above is a cross-sectional view of a hot-formed titanium rivet. Below is same view of cold formed rivet

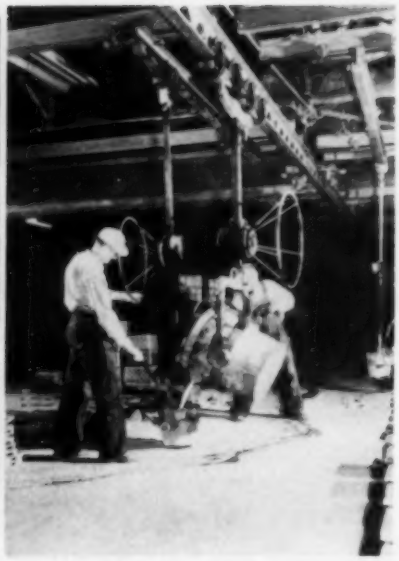


SHEAR TESTS ON TITANIUM RIVETS

Rivet Type	Single Shear	Double Shear
Flush Head	*960 Unannealed	1800 Unannealed
Flush Head	1000 Unannealed	1820 Unannealed
Flush Head	900 Unannealed	*1730 Unannealed
Flush Head	*800 Annealed	1820 Annealed
Flush Head	560 Annealed	1580 Annealed
Button Head	960 Unannealed	*1860 Annealed
Button Head	980 Unannealed	1890 Annealed
Button Head	960 Unannealed	1870 Annealed
Button Head	960 Unannealed	*1640 Annealed
Button Head	960 Unannealed	1820 Annealed



Cupola is tapped directly into transfer ladles of 1000 lb capacity which move on monorail to pouring areas. Switches and side tracks eliminate traffic jams



Metal handling and transfer from one ladle to the other is completely mechanized. Transfer ladle (right) moves down the monorail, fills smaller ladles

Handling Goes Up... So Does Capacity

OVERHEAD HANDLING that combines individual cranes for pouring in 27 production areas and monorail transport of hot metal to each area has helped Allis-Chalmers Mfg. Co. increase production capacity about 60 per cent at its LaCrosse, Wis., foundry.

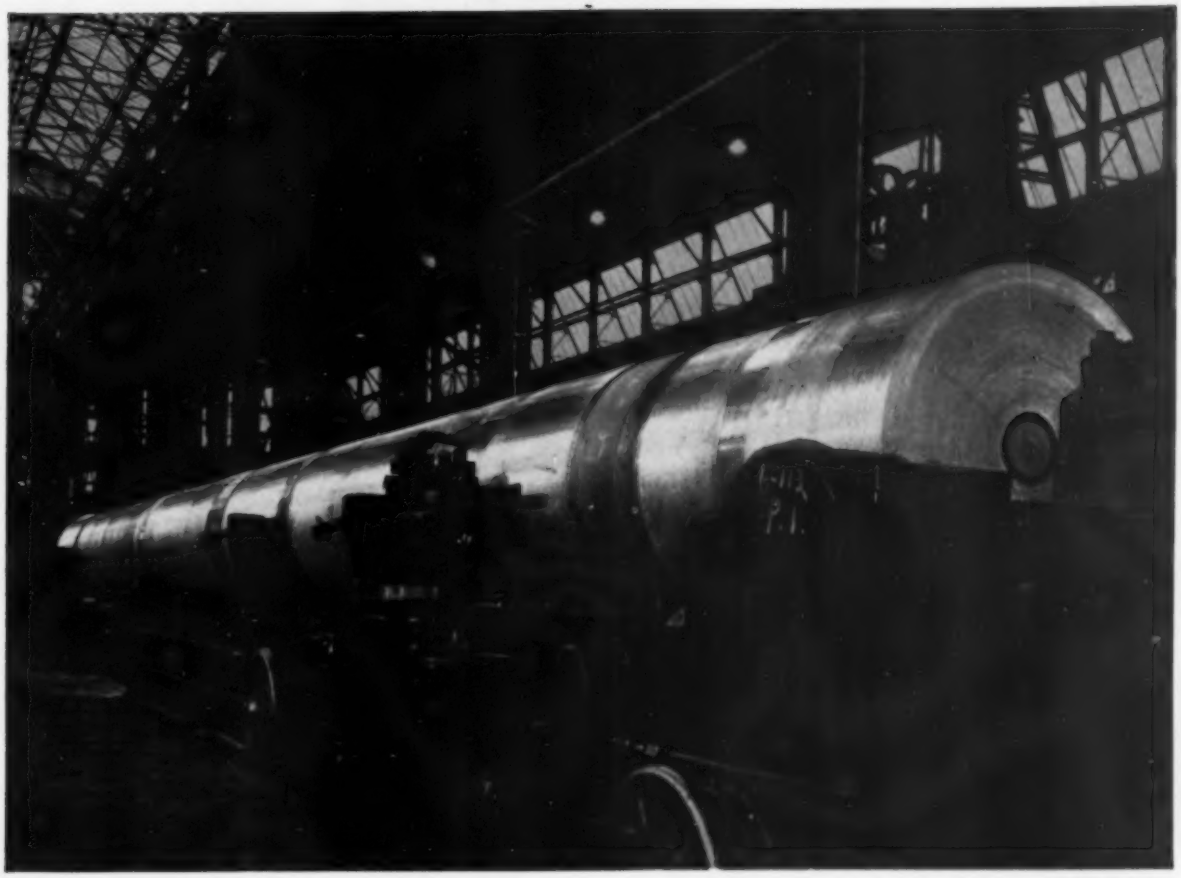
Cranes and monorail are Whiting Trambeam systems, manufactured by Whiting Corp., Harvey, Ill. In addition to mechanization of hot metal handling, the new system makes more efficient use of floor space — molds can be stacked higher; cuts down dust because of reduced floor traffic; improves productivity; and makes for faster, more efficient charging.

Travel by Rail—From the cupola, transfer ladles of 1000 lb capacity move to the tapping area on a monorail sidetrack, which eliminates traffic jams between filled and empty ladles. The filled transfer ladle then moves on the main monorail line to production.

No reservoir ladle is needed; metal is poured directly into transfer ladles. Total metal now poured ranges from 35,000 to 40,000 lb in 2 hours and 20 minutes, as compared with a maximum of 25,000 lb in about the same time as previously. Former methods used sulky ladles for transfer of metal from cupola to pouring floor and hand ladles for pouring metal into molds.

Charging Speeded—A Trambeam crane has also helped to speed up charging the cupola. This crane, installed outside the building, lifts a cone-bottom bucket from the pit up to the level of the charging door, then runs the bucket into the wishbone support in the cupola. The time cycle for a 2000-lb charge has been reduced to 4½ minutes, a considerable improvement over former methods, which required manual loading of wheelbarrows, raising them with an elevator and then hand-charging the cupola.

Mechanized pouring permits higher stacking of molds such as these for plow shares. Hand pouring methods formerly used in the foundry, made a stack two molds high the maximum



Finishing Touch for 68-FT. PRESS COLUMN

Product—Column for Forging Press

Overall Length—68 feet

Body Diameter—43 inches

Bore Diameter—8¾ inches

Weight—317,185 pounds

This 158 ton shaft, one of the largest forgings ever made, is all-Midvale-produced from melt to bore. Its role, one of four supporting columns for a 25,000 ton forging press.

The shaft has been rough machined on a combination turning and boring lathe. As you see it the trephining of the hole has just been completed for the entire length of 68 feet.

This specialized operation climaxes a forging job that illustrates the completeness of Midvale's engineering and production facilities. First the ingot. Specification called for minimum yield point of 60,000 psi., ductility equal to 18% elongation. To meet this Midvale metallurgists chose an alloy composition. More than 336 tons of nickel-moly steel were poured into the 116-inch ingot mold. Six forging steps later the rough shaft went to the lathe. Tensile tests showed the material produced an actual yield strength of 76,000 psi. and an elongation of 20%.

Midvale's forging facilities are at your service, too. Production, beginning at the furnace, is backed up by rugged machine tools and steelmaking skill. Forgings of 300 or 300,000 pounds all get the same attention. Try Midvale's experience and facilities on your next forging job.

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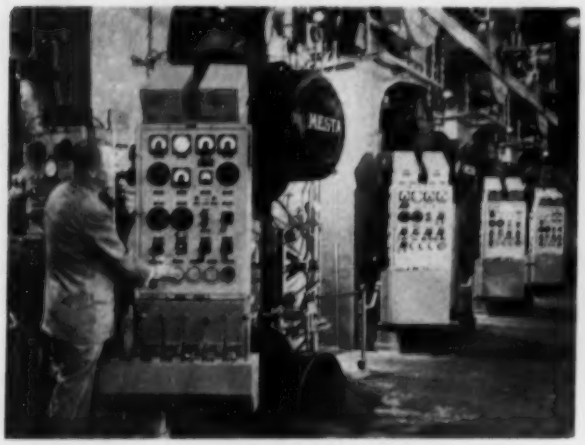
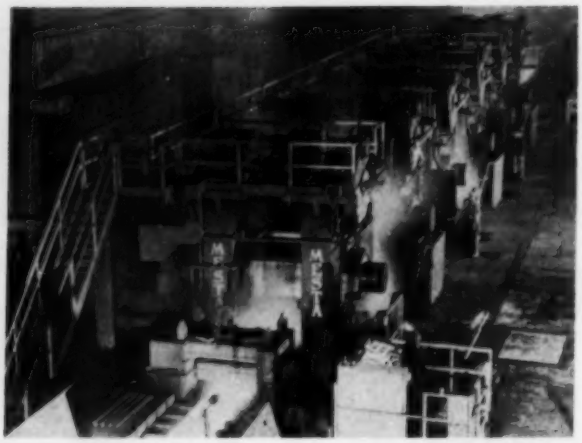
FORGINGS, ROLLS, RINGS. CORROSION AND HEAT RESISTING CASTINGS



With president E. J. Hanley at the controls, Allegheny Ludlum starts up the new 56-in. cold mill at Brackenridge



Largest single installation in expansion program just completed is this 6 stand, semi continuous, hot strip mill

Last Expansion Piece In Place

Nine years and $96-million later, Allegheny-Ludlum chases last of the construction gangs out of its plants. They now have optimum production versatility

ALLEGHENY LUDLUM Steel Corp. marks the climax of a nine-year $96 million plant rebuilding program by beginning operation of a new 56-in. continuous cold rolling mill. It's at the firm's Brackenridge, Pa., plant.

Built by Mesta Machine Co., Pittsburgh, this most recent addition is expected to maintain the company's position in production of alloy steels and other metals.

Latest Mill — Last of Allegheny Ludlum's planned postwar installations, the four-stand tandem cold rolling mill will enable the firm to offer regularly 48-in. wide coils of cold rolled electrical and stainless steel. Importance to fabricators is that they can improve efficiency with extra output and reduced waste.

Aside from this production the new mill will roll the company's other high alloy specialities. Installations include a full line of equipment for continuous annealing, pickling and shearing operations.

Careful Rolling Required—High quality performance of the new cold rolling mill is well suited to production of silicon steel, which makes up about 25 per cent of the company's dollar volume. Another 50 per cent comes from stainless steel. Tool steels, high temperature alloys and carbides make up the remainder.

Rolling silicon steel is a tough proposition, production men at Brackenridge admit. It's tough and brittle, subject to edge-cracking and breakage and requires exact control of tension in cold rolling. New cold mills and other equipment overcome these difficulties.

Quick Change Artists — Allegheny Ludlum also designed its new postwar mills with an eye to versatility. Comments Clark W. King, executive vice president: "In our business we have to be able to change from one type, grade and size of steel to another many times during a single work shift. One of our mills may handle several grades of stainless steel, together with silicon steel and titanium in a single day."

Following an industry-wide trend, much of Allegheny Ludlum's postwar program is aimed at converting production from sheet to coils. Well adapted to the firm's production of stainless steel coils is a 56-in. single-stand reversing cold mill completed in 1951.

13 Furnaces—Total steelmaking capacity at Brackenridge now consists of two electric furnace shops and an open hearth shop. Nine furnaces in the "old shop" were installed between 1927 and 1947. Allegheny Ludlum installed four furnaces in the "new shop" in 1949 and 1950. Two of the newest furnaces have 60-ton capacity; two have 70-ton capacity.

Considerable auxiliary equipment has been added to the cold finishing department in Allegheny

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Morganization now includes a complete survey of your Morgan equipment by experienced Morgan men. The condition of all parts is checked and reported to your maintenance department. Genuine Morgan parts will help maintain the designed efficiency of the equipment. If improvements should be made to increase this efficiency, our engineers will suggest how to make them at lowest cost.

This is another segment of "Morganization" . . . designing, building, servicing that makes Morgan Engineering machinery best. Write us for information on Morgan Maintenance Surveys for *your* equipment.

MORGAN ENGINEERING

THE MORGAN ENGINEERING COMPANY, ALLIANCE, OHIO

Ludlum's postwar drive. Additions include one 48-in. and two 40-in. slitting, leveling and inspection lines for processing silicon steel. Also included is a 50-in. shot blast cleaning, pickling and side-trimming line for processing silicon and stainless steels and a silicon strip normalizing line with a combination gas fired, electric roller, hearth type furnace.

Newest Electrical Equipment — Complex electrical and control installations for the 56-in. continuous cold mill were furnished by General Electric Co., Schenectady, N. Y. While the new mill will have 15,000 hp, it is being broken in with 7500 hp. All four stands and tension reel of the mill will be powered with direct-drive, double armature motors operating under adjustable voltage control. Now a single armature is installed on each stand and reel.

Source of power is one motor-generator set consisting of one 1000-kw, two 1600-kw and one 400-kw generator, all 600 volt dc, as well as one 125-kw generator and one 50-kw generator, both of 250 volts dc. Drive motor for the set is a 9000 hp, 6600-volt, 514-rpm synchronous motor.

Special Feature — An unusual feature of the drive is that power for each motor armature is supplied by a separate generator. Armature circuit of each motor and its generator is entirely isolated from the other. If any motor or motor-generator set fails, the mill can operate on at least half the total connected horsepower.

Capacity of the new mill is 300,000 tons of stainless, silicon and alloy steel annually. It operates at speeds as high as 2000 fpm. Currently investment in the mill stands at $8 million. Additional improvements will expend about $1 million.

Sales Potential — Commenting on requirements for high alloy steels and other special metals, Mr. Hanley, president, comments: "Higher operating temperatures, more corrosive atmospheres, more exacting mechanical and physical requirements in structural materials leave little doubt that future uses of specialized alloy steels and other new, tough metals will be far greater than ever before. Each new technological improvement requires metal to fit its specific need."

MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

THE BOTTOM of the machine tool slump has been reached, according to builders in the Cincinnati area. Orders are now coming in at a sufficient rate to make them optimistic about the rest of 1954. Backlogs, now roughly 3 to 4 months, are expected to hold.

They Say—Outlook for next year is good too. Machine tool industry should click through 1955 with a business volume comparable to, or maybe 10 per cent better than, today's level.

This level, they feel, is adequate to provide them with a livelihood, and at the same time it will give them time to trim their own production systems to peak efficiency, to establish keen sales programs, to bring forth an array of new machines and to redesign and improve existing lines.

The Plum—All of these Cincinnati builders, plus those in the rest of the country, are getting set to take a generous swipe at the obsolete equipment now in use. This program will call for some customer education in some cases, good old shirt-sleeve selling in others. The builders feel that if machine tool users run a thorough check on modernization potential in their own plants, both users and builders will be healthy for years to come.

Meanwhile, what Washington does or doesn't do with regard to defense capacity continues to be important. Some builders are counting on an increase in Government buying, some are gearing their plans to an absence of it.

It will have most effect on the big machine tools, but would, no doubt, extend its benefits across the entire industry. In addition to what it'd do for them, builders feel the Vance plan is the best way yet proposed to provide for U. S. defense capacity.

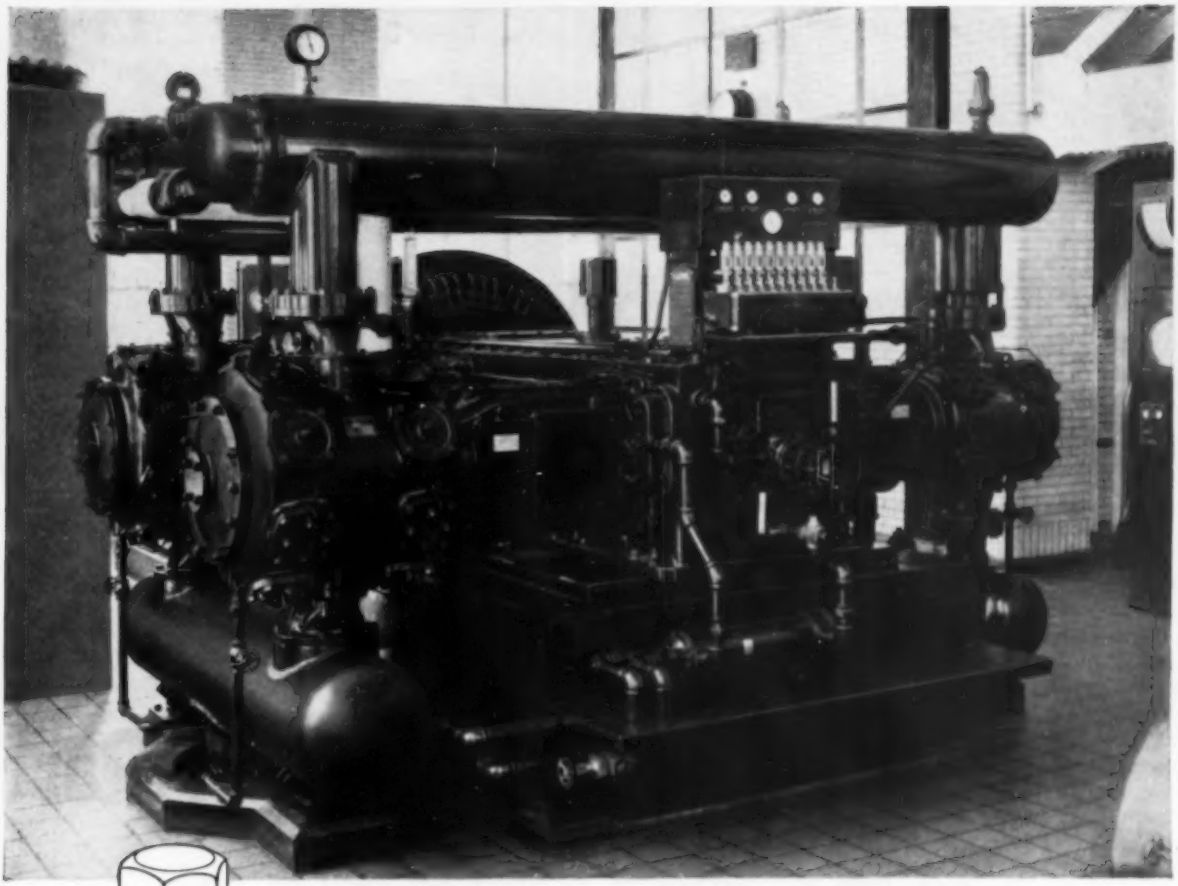
Showrooms

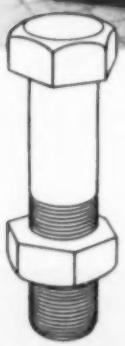
To your list of machine tool builder's showrooms worth seeing, add that of Lodge & Shipley Co., Cincinnati. It has over 2100 sq ft of usable space, and is complete with a raised lobby. The area houses 6 machines, under power and ready to run. In addition, they have several lathe components, mounted on viewing stands.

Press Standardization

The National Machine Tool Builders' Association announces publication of a glossary of engineering terms for hydraulic presses. It's the first of five studies on problems of standardization and is aimed at achieving interchangeability of dies and fixtures between hydraulic and mechanical presses.

The study was completed by the Engineering Standards Committee of the hydraulic press section of the association. It will be followed by others on metalworking presses, vertical open gap presses, compression and plunger molding presses, and on accumulators, according to John M. Dolan, vice president and general sales manager of the Hydraulic Press Mfg. Co., and chairman of a 3-man steering committee.





JUST BOLT IT TO THE FLOOR

that's all Ford had to do

Expanding operations at Ford Motor Company's assembly plant in Buffalo, N. Y. demanded additional shop air capacity. It had to be installed quickly and, if possible, without disruption to existing facilities.

Inasmuch as the installation was to be on the second floor of the power house, Ford engineers selected a Clark CMA-4, 350 horsepower, Balanced/Opposed Compressor. The low installation cost was an important factor.

With the Clark motor-driven unit, it was unnecessary to run foundations all the way down to the basement. Piping, which was beneath the proposed compressor location, did not have to be moved.

Because of the perfect balance of the Clark unit, it was possible to mount the motor and compressor on a steel sub-base which was bolted to floor I-beams. No foundations were required. No pipes were relocated.

. . . nor was there any lost production. The Clark unit was tied in over a weekend.

The Buffalo assembly plant is but one of many Clark Compressor installations serving the Ford Motor Company's vast operations.

Before you consider any proposed compressor location *impossible*, it may save you money to talk it over with your nearest Clark representative. In the meanwhile, make sure you have Bulletin 118 in your files. Write today.

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PRECISION BY THE TON **CLARK** **balanced/opposed compressors**

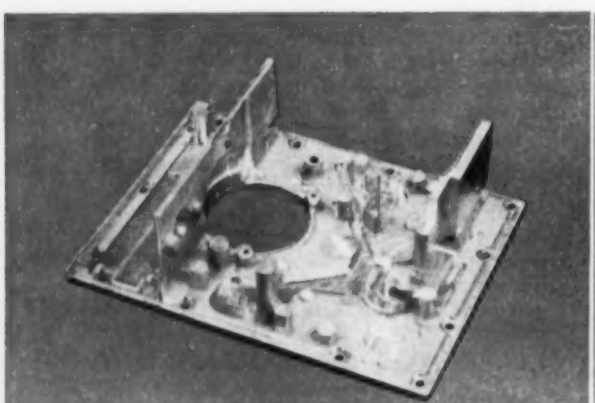
150-4500 HP

Operator checks a 6-lb aluminum panel from one of Fairchild's barrel finishing machines. Foam helps control relative movement of stone chips and part being tumbled

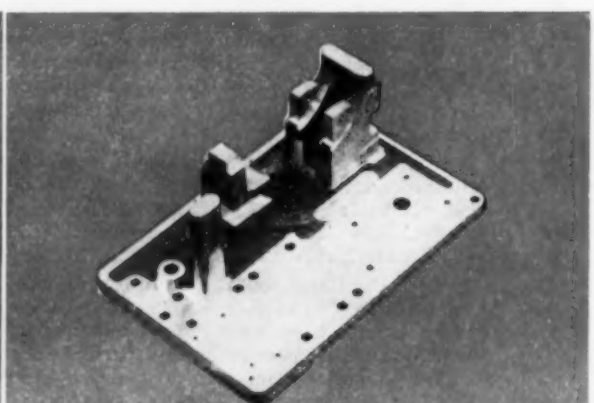
Wide variety of parts finished is illustrated here. They range from the tiny parts on black paper (foreground) to the massive aluminum, bronze and magnesium castings

Barrel Finishing Tumbles Part

Parts from tiny washers to 32-pound bull gears go through Fairchild's finishing department. Over $25,000 worth of equipment was amortized in less than 3 months



Frail 8 x 5-in. aluminum plate; close machined bosses; flat side within 0.0002 in. Chip size: #4 Honite, 1 qt water, ½ lb nonabrasive compound. Barrel Speed: 32 rpm. Job Time: 15 min. Time per piece. 4 min. Previous bench time per piece: 35 min



A 6 x 4-in. magnesium plate with bosses and holes. Debur and polish. Chip Size: #4 Honite, 8 qts water, 1 lb nonabrasive compound. Barrel Speed: 25 rpm. Job Time: 15 min. Time per Piece: 15 sec. Previous bench time per piece: 450 Sec.

Closeup of aluminum shutter case being deburred without injuring black anodic film that covers most of it

Costs

By L. H. HOPEWELL
Fairchild Camera & Instrument Corp.
Syosset, Long Island, N. Y.

EVIDENCE that barrel finishing can be applied to a far wider variety of metal parts than was previously thought possible, that the technique can provide better finishes faster with consequent economy, has been steadily accumulating at Fairchild Camera & Instrument Corp.

For example, more than $25,000 worth of barrel finishing equipment acquired in the fall of 1953, paid for itself out of savings during the final quarter of that year.

During first six months of barrel finishing of precision metal parts, an average of 1500 different lots of parts were deburred and finished weekly—in about one-third to one-fourth the bench time.

More Proof—Parts include everything from tiny washers and hair-thin shutter leaves to 32-lb bull gears and eight- and ten-lb castings with multiple bosses and holes, and even pieces with close tolerances of .0002 in. and less.

In a number of instances, finishes that would have been too costly by hand are now being obtained almost incidentally in the course of routine deburring in the barrel. More uniform finishes are also being obtained. The inevitable small variations in hand work are eliminated when the entire lot is finished in the barrel.

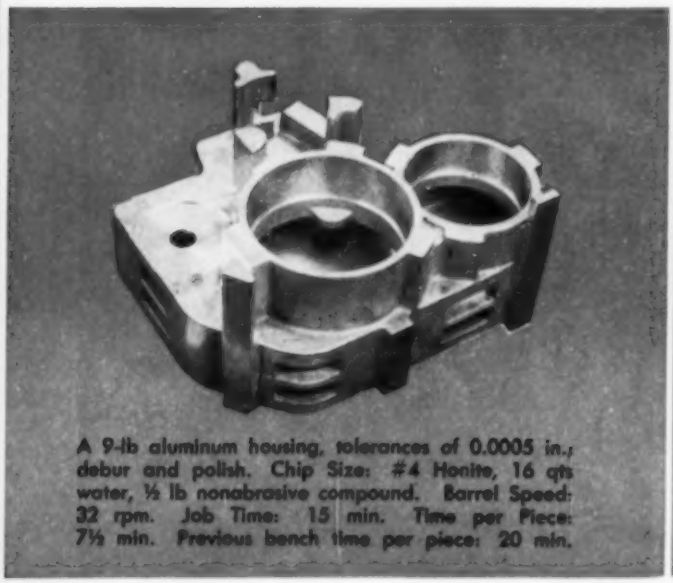
In addition, parts that are deburred and finished by barrel are spotlessly clean, which has proved to have several advantages, including better machining. More than half of these parts go on to further machining; and, psychologically, the machinists seem to respond better to clean parts and do better work on them. Assembly plating and painting are also facilitated by the uniformity and cleanness of the barrel-finished parts.

Three Keys — These facts come from individual job records that constitute one of the three principal secrets of successful barrel finishing. The other two key factors are: Scientific testing to find the best barrel finishing technique for a particular part; and, imagination and willingness to experiment methodically to develop still better techniques.

However, neither testing nor willingness to experiment can achieve their full value unless adequate records are kept available.

File Card System—At Fairchild, the number of each different piece is recorded on an individual card, which is then filed by number in a desk-top file. On each card goes such information as the results of testing to find the best method of barrel finishing that part; the results of subsequent production runs on that part, including any adjustments in procedure; and the results of any special experimentation aimed at finding a still better method for that part.

As a result, when a new lot of



A 9-lb aluminum housing, tolerances of 0.0005 in.; debur and polish. Chip Size: #4 Honite, 16 qts water, ½ lb nonabrasive compound. Barrel Speed: 32 rpm. Job Time: 15 min. Time per Piece: 7½ min. Previous bench time per piece: 20 min.

A 1-lb bronze shutter leaf housing, 1 in. thick, 8 in. diameter; debur and polish. Chip Size: #4 Honite, enough water to wet stones, no compound. Barrel Speed: 32 rpm. Job Time: 15 min. Time per Piece: 22½ sec. Prior bench time per piece: 435 sec.

that particular part is received for barrel finishing, the operator need only check the card file to find the right method to use. At Fairchild, that information is on tap for thousands of parts.

Proper Testing—The second key to barrel finishing success is proper testing to determine the best technique for finishing any individual piece. Three chief variables are examined: Barrel speed is determined semi-finally in one test run; quality of water and the type and quantity of compound are decided in a second test run.

Experience has shown that loading the barrel chips to about 80 per cent of capacity is about right for most of the department's jobs. All tests start with that load. Size of individual chips is determined "by eye" for the test, considering No. 4 "Honite" chips as medium and using heavier or lighter chips depending on whether heavy work or fine finishing is to be done. Just enough water is used at the start of the test to wet the stones; and no compound is used at the start.

Speed Tests — For fastest cutting, barrels should be run at the fastest speed that is possible without nicking the pieces; a test run is usually started at a speed that is just a little slower than the fastest speed than seems likely for the job. First the barrel is run two turns and then the part is examined for cutting action and nicking; then ten turns and examined; then five minutes and examined; and, finally, 15 minutes and examined. At any point the speed may be increased 4 rpm if there is no nicking (or decreased, if nicking has developed) until the fastest speed without nicking is determined.

Then, using another piece from the lot, a second test run is made to determine the proper quantities of water and compound. (The type compound is determined by the type metal involved and the nature of the work to be done, such as deburring and polishing.) The right combination of water and compound should provide faster cutting and a finer finish than is possible with only wet stones.

Results Recorded — All of this normally takes about three-quarters of an hour, allowing about 20 minutes for each of the two test runs. Results, of course, are recorded on the file card for the piece, and the method developed for that particular piece, together with subsequent production-run adjustments, is followed on future production runs, with assurance of optimum results.

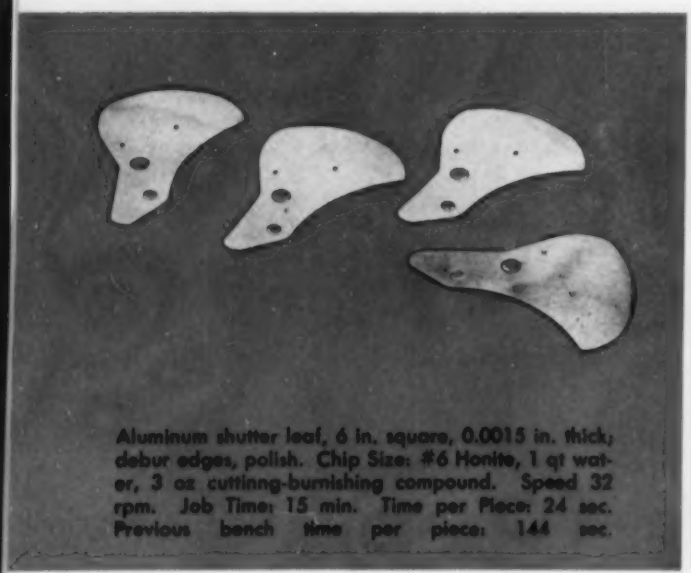
The "week load"—the number of metal pieces to be loaded into the barrel at one time—is determined at the start of the first production run. On the basis of past experience, we can estimate whether a particular size, shape and weight of piece probably can be loaded 25 to a barrel, 100, 200 or more.

New Ideas—There are almost unlimited possibilities for barrel finishing economies, if one has the imagination and willingness to experiment scientifically. An example is the use of steel shot—polished steel diagonals made for burnishing. These are mixed in with the "Honite" stones, adding weight to the mass.

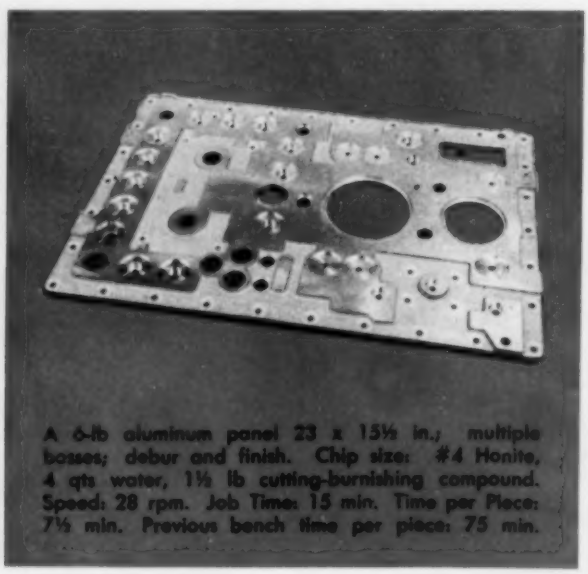
Still another example is the use of higher-than-average speeds with varying relationships between chips, water, compound and pieces in the barrel. Speed is a well worth experimentation. It can materially reduce running time on a job and make for vast strides in operating efficiency.

Uniform Cycles—At Fairchild, the objective of the barrel finishing department is to handle all the barrel finishing jobs, both in deburring and finishing, in a single 15-minute time cycle. This objective has now been realized for all but a few parts with no loss of quality. In fact, in many instances, quality has been enhanced.

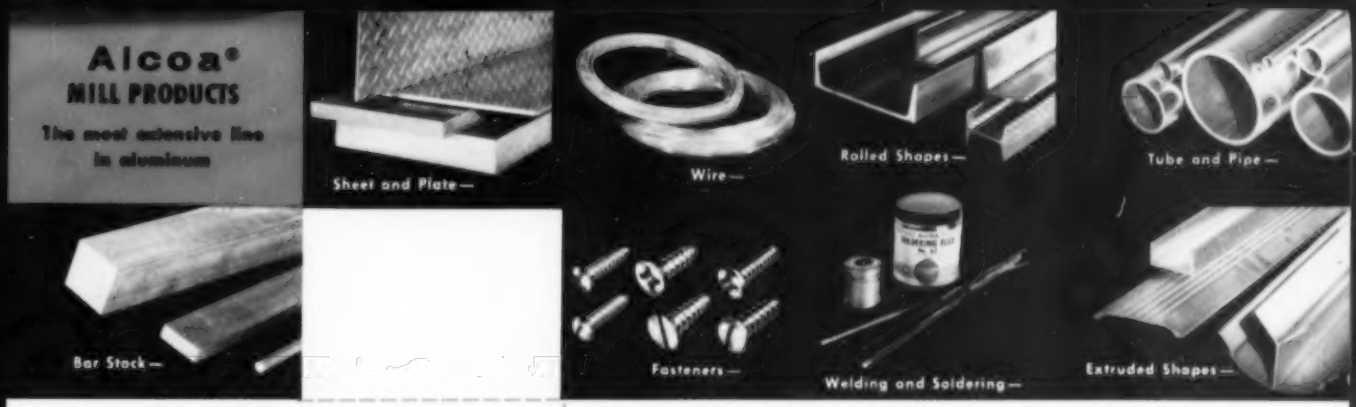
Barrel speeds at Fairchild vary from 4 to 32 rpm, and two new machines to be installed shortly will permit speeds up to 90 rpm. From the evidence that has been compiled, we believe that these high speeds will accomplish the difficult feat of internal burring and produce even finer external finishes.



Aluminum shutter leaf, 6 in. square, 0.0015 in. thick; debur edges, polish. Chip Size: #6 Honite, 1 qt water, 3 oz cutting-burnishing compound. Speed 32 rpm. Job Time: 15 min. Time per Piece: 24 sec. Previous bench time per piece: 144 sec.



A 6-lb aluminum panel 23 x 15½ in.; multiple bosses; debur and finish. Chip size: #4 Honite, 4 qts water, 1½ lb cutting-burnishing compound. Speed: 28 rpm. Job Time: 15 min. Time per Piece: 7½ min. Previous bench time per piece: 75 min.



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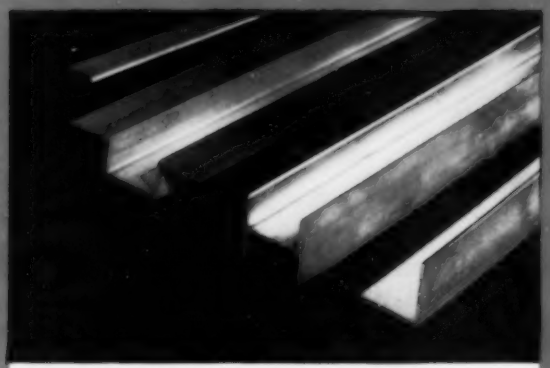
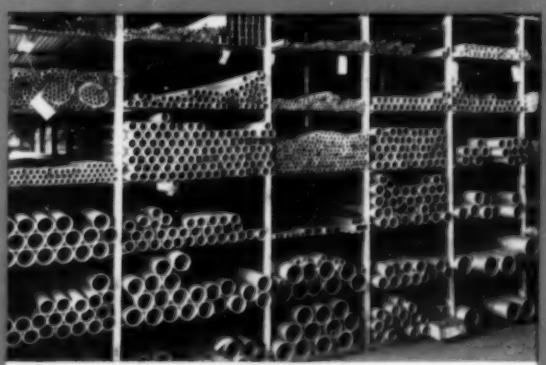
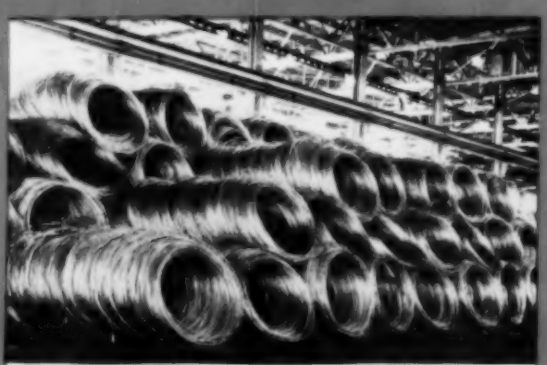


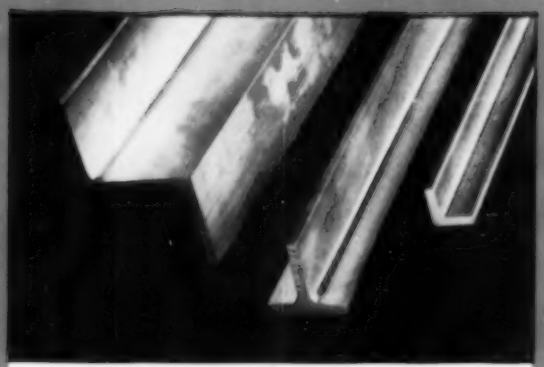
EXTRUDED SHAPES: For thresholds; window sills; door frames; glass stops; copings; gravel stops; trim; truck bodies. Also angles; channels; tees; zees; etc., for structures.



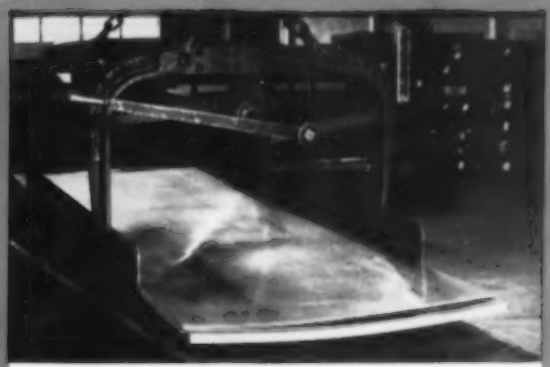
TUBE AND PIPE: Coiled tube; Utilitube®; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; construction pipe; rigid conduit.



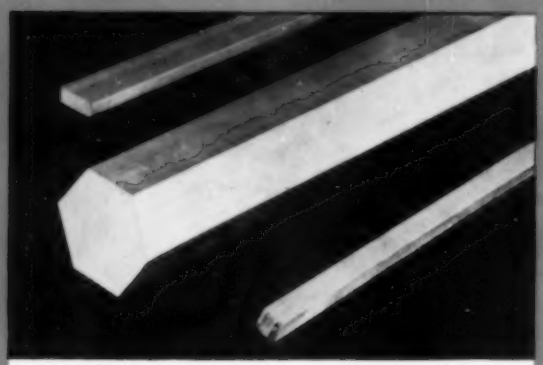
WIRE AND ROD: Coiled and straight length; flattened wire; rivet wire and rod for die heading operations in manufacture of rivets, nails, bolts and screws.



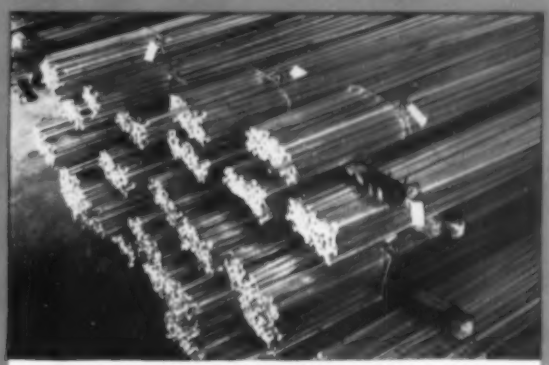
ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; tees; zees. Suited to a variety of structural applications.



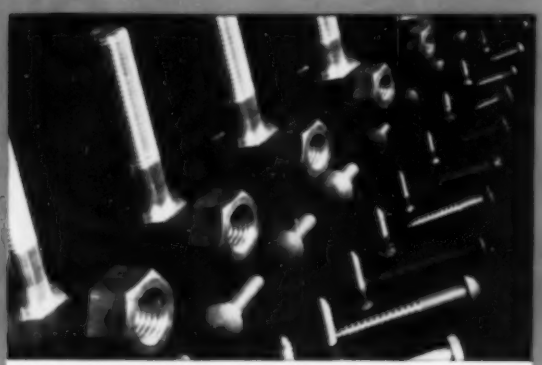
SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



BAR STOCK: Square, hexagonal and rectangular bar stock in all commercial alloys. Hot rolled and cold finished to final dimensions for superior tolerance and finish.



SCREW MACHINE STOCK: Available in 2011-T3 (formerly 11S-T3), the free-machining alloy, and 2017-T4 (formerly 17S-T4), a higher strength alloy, plus 2024, 6061 and 7075 (formerly 24S, 61S and 75S).



FASTENERS: Machine screws, wood screws; washers; nuts; bolts; rivets. Recommended for fastening aluminum to prevent electrolytic damage.

WELDING AND SOLDERING: Welding and brazing wire; welding and brazing flux; solder flux; solder.

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Denver
Marsh Steel Corporation
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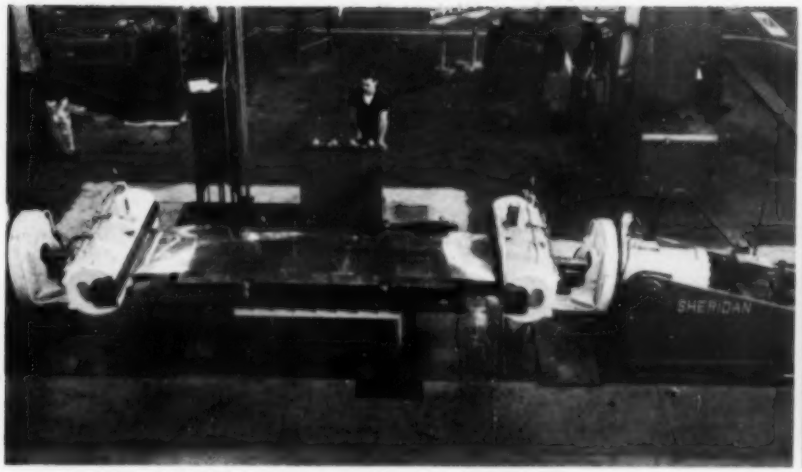


Most of the stretch forming at Ryan is done on this Sheridan sheet press. The unit is equipped with flexible jaws that are capable of exerting 90-ton force

Smaller of the Sheridans—a 10-ton single horizontal ram stretch press

STRETCH FORMING

Tough Contours Are a Trademark

HARD-TO-CONTOUR shapes have become the trademark of the stretch-former, particularly among aircraft builders.

Until it purchased its own presses, most of Ryan Aeronautical Co.'s stretch operations were farmed out—sometimes as far as Dallas. Today, almost all work has been pulled into the Ryan plant. Savings are substantial—in fact, equipment literally pays for itself.

And the bill is sizeable: $28,000 for the table-type extrusion press; $60,000 for the sheet stretch press.

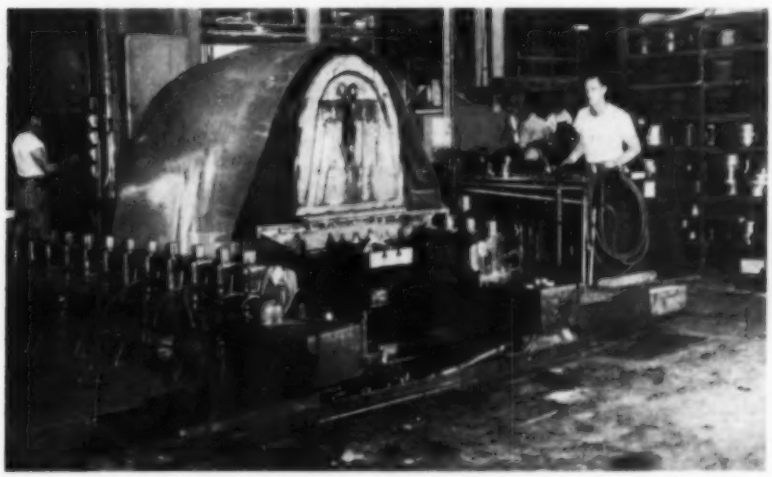
Functions—The larger of the two Sheridan presses pictured has 90-ton stretch capacity, is used to form skins for Boeing KC-97 aft fuselage sections. Its jaws pull aluminum taut as three hydraulic rams force up the die table. Jaws then stretch-wrap the skin around the forming die.

The smaller Sheridan has a 10-ton stretch capacity, forming extruded parts—also primarily for the KC-97 fuselage. There is one variation in the operating principle: The single ram is horizontal and pushes the die table forward against hydraulic pressure of the jaws. The latter pull the component, wrapping it around the die.

Hot Dies—An Erco stretcher, oldest of its kind at Ryan, has stationary jaws parallel to the ram. Such metals as magnesium and titanium must be stretched on hot dies, so the Erco gets the job of stretching magnesium skins for the company's successful pilotless jet target drone.

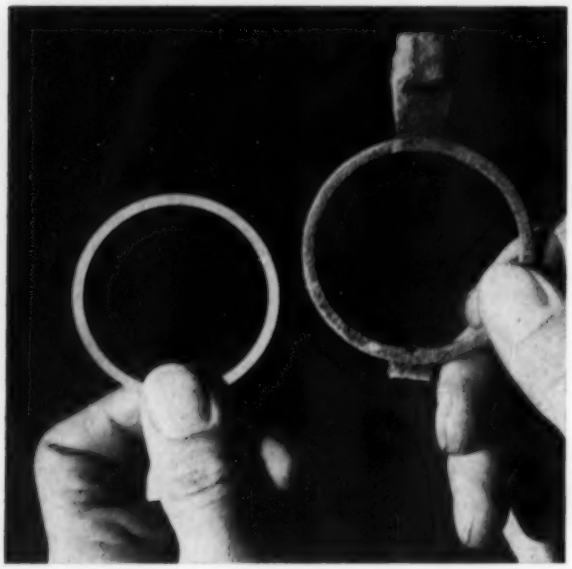
Experimental work with titanium also has been done on this unit.

Tolerances—Stretching is performed within certain limitations, such as thinning the metal. These tolerances, plus degree of angle and flange length, are established by engineers and checked closely in inspection. Seldom is it necessary to exceed more than half the available elongation to form the average part.



A Ryan oldtimer, this Erco model uses hot or cold dies. It has played an important part in the company's extensive development work on titanium parts

Success Brings a Shift to Powder



Powdered iron piston ring needs little finishing when compared to conventional cast ring that it replaces

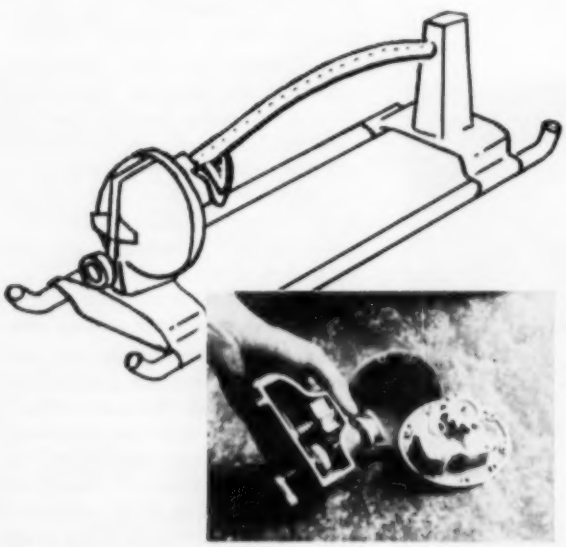
WHEN POWDERED IRON works for little piston rings, it's a logical step to try for bigger sizes. Muskegon Piston Ring Co., Muskegon, Mich., is ready to test that thesis on the automobile engine market.

In the past two years the company has produced over 2½-million powdered metal rings for automatic transmissions and small gasoline engines, but has been casting automobile engine rings by conventional techniques. One factor pushing the change to powder is the difficulty of casting rings thin enough. Sometimes they have to be cast doubly thick and sawed in two, a costly proposition.

How Powder Saves — Powder metal rings, with their close tolerances, eliminates such problems. Tests show they have tensile strengths as much as 50 per cent greater than cast rings of the same size. Powder still costs more than hot metal, but raw materials require far less storage space. Muskegon estimates it can match its cast ring output in one-fourth the space.

Such savings will go far to keep costs down on the new rings. A big selling point is likely to be that the thinner powder-metal rings will cut horsepower losses traceable to friction.

Research Brings a Shift to Zinc



Redesigned zinc die castings (right) keep water from most moving parts at the sprinkler. Resist corrosion

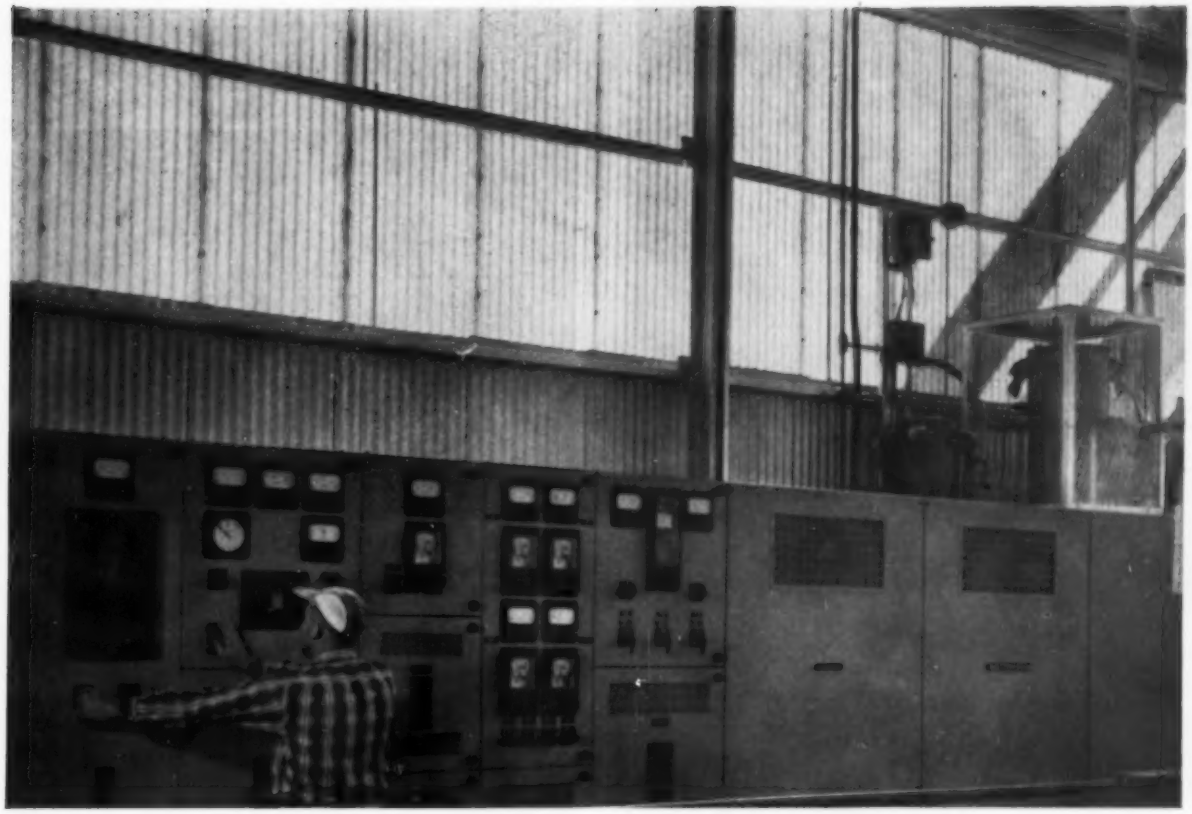
WHEN LAWN SPRINKLERS are your business, it pays to know something about water. That's why Melnor Metal Products Co. made a coast-to-coast water survey.

They found out, contrary to expectations, that most of the country's water is on the acid rather than the alkaline side. In terms of their product, that spelled a shift from aluminum to zinc die castings.

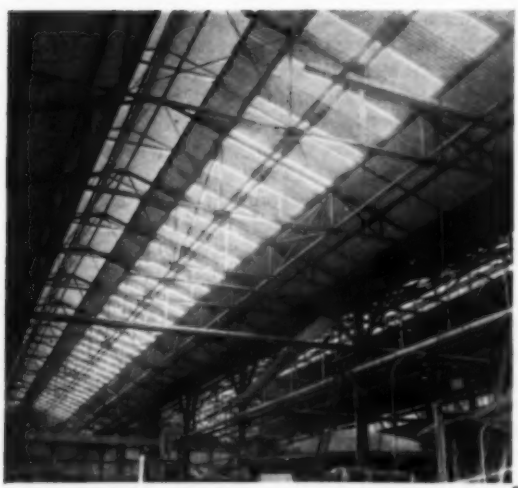
Tests Showed Trouble—Water from some sections was so acid that it actually ate through the walls of aluminum castings the company had been using. Clogging of the sprinkler mechanism by corrosion products was common. Clogging by dirt was another complaint.

Answer to the situation was complete redesign. Doehler-Jarvis Division of National Lead Co. helped with zinc die castings that featured a sealed gear housing to keep dirt and water from moving parts. A chrome acid dip enhances corrosion resistance and paint adherence.

Best of all, the new sprinkler costs less to produce than the one it replaces.



NEW LOW PRICES Reduce Corrulux® Daylighting Costs!



Where vandalism or industrial hazards make daylight costly in terms of broken windows, reduce maintenance expense with Corrulux. Daylight, filtered through Corrulux, is diffused . . . delicately tinted . . . gentle on the eyes. Corrulux is a special product uniformly reinforced with Fiber-Glass. It withstands severe impacts. It is easy to install in large panels. And in skylights, its great strength makes light work of snow loads.

Now it costs less than ever. Specify L.O.F. Corrulux and *be sure*.

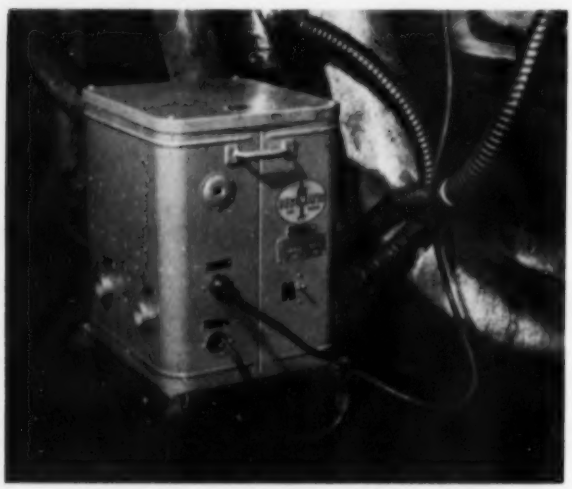
Write for
FREE
FOLDER
Dept. S-F

***Corrulux* Saves 4 Ways**

1. On engineering.
2. On framing.
3. On installation costs.
4. On maintenance. For new and existing buildings.

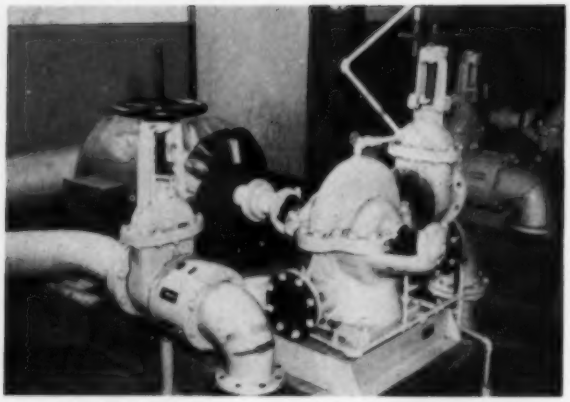
Corrulux Division
LIBBEY • OWENS • FORD GLASS COMPANY
P. O. BOX 20026 • HOUSTON 25, TEXAS

Sealing of controllers on heat treat furnaces is typical of the processing of all plant electrical equipment



Each of four 760-hp boilers is sealed and equipped with dehumidifiers to prevent any interior corrosion

Underneath this shrouding is a 72-in. planer. Note glass window for periodic check of VCI powder supply



Water pump motors were shrouded, elbows turned and openings sealed. No water can collect during deactivation

Armor Plant

Navy ships, army tanks, now whole war plants get the mothball treatment. This big cast armor plant goes to sleep with its insides full of VCI and other rust inhibitors

SHINING example of the new approach to the nation's military preparedness is the "mothballing" job recently completed at the sprawling cast armor plant in East Chicago, Ind. In size and scope, this project probably has no parallel.

American Steel Foundries built the plant in 1942, operated it until 1945. It was idle from then until early 1951 when ASF was commissioned to reactivate it for the Korean conflict. With the need for armor plate reduced, the Ordnance Corps signed a deactivation contract with ASF in late 1953.

This time, however, the contract called for utilization of perfected "mothballing" techniques so that the plant could be rapidly reactivated. That job is complete, and while ASF isn't telling how fast they could be turning out armor again, it's conceded that the plant would be ready before patterns were acquired or the work force trained.

Key Materials—Development of three materials—rust-inhibiting greases and oils, air-dry protective coatings that last indefinitely, yet wash off with commercial solvents and VCI corrosion-inhibiting powder—make it possible to lay a plant away without disassembly and coating of parts with hard-to-remove protecting compounds.

Rust-inhibiting greases and oils replaced conventional petroleum products in motors, machines, hydraulic systems, etc. Any machine or assembly that could be made airtight either of itself or by construct-

Compressors are partially dismantled, and all interior surfaces cleaned out and covered with protective coating

All plant lifting chains were cleaned in solvent, dipped in protective coating and stored on steel racks

Joins the Reserves

ing a sealed housing around it, was left intact and protected with VCI powder. When the VCI sublimes, it has tremendous affinity for oxygen, without which there can be no rusting. Provisions were made for adding fresh quantities of VCI into sealed machines.

Small Machines—Smaller, portable machines were inserted in plastic-coated, heat-sealed paper bags instead of the plastic-coated screen mesh enclosures built for larger machines. VCI powder was inserted before sealing, and the bags were then stored on tables or wood blocking.

All materials handling trucks and mules were cleaned, lubricated and exterior surfaces painted. Batteries were removed and sold. Protective coating was applied to all machined surfaces. Tires were cleaned with solvent, then the equipment was blocked up to relieve tire load.

Quick Sketch — Obviously, the complete deactivation program cannot be detailed here. Specifications of the contract between ASF and the Ordnance Corps are extremely thorough and include employment of a permanent skeleton force at the plant. Their job is to periodically inspect and maintain the mothballed equipment.

Another section of the contract makes ASF responsible for the deactivation and protection of a number of surplus machine tools to be shipped in from other sections of the country. After similar treatment, these tools will be stored in one section of the plant.

Swing grinders were cleaned, repainted and all working parts protectively coated. Note shrouding on the motors

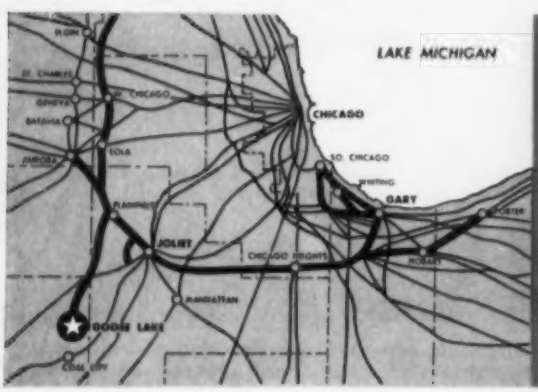
This primitive blast furnace was probably used in making early iron products. Cylindrical hand-operated bellows supplied air to a mixture of iron ore and charcoal in the clay mound at center. (From Bettmann Archive)

FIRE CLAY

...ageless contribution to man

HOW *lucky* that nature provided man with the industrial essentials . . . *iron* in ore . . . *fire* to melt the iron . . . *fire* clay to contain the molten metal. As in ancient times, these basic elements serve modern man. And as metallurgy advances and required furnace temperatures go higher and higher, good fire clay becomes an even more important member of the team.

WITH the crucial role of refractories constantly growing, steel plants and foundries look to the Illinois Clay Products Company with its extensive Goose Lake clay deposits, modern processing facilities and *nearness* to the "heart" of industry.



ILLINOIS CLAY PRODUCTS COMPANY

Manufacturers of Goose Lake and Chem-Brix Refractories and Therm-O-Flake Insulation

Sales Office — Chicago, Illinois, 208 S. LaSalle St.

Main Office — Joliet, Illinois, Barber Building

The Illinois Clay Products Co., Goose Lake Plant, is located near Joliet, only 55 miles from Chicago. Excellent shipping facilities provided by the Elgin, Joliet and Eastern Railway — the Outer Belt Line.

This clay deposit is estimated to be over 250 million years old.

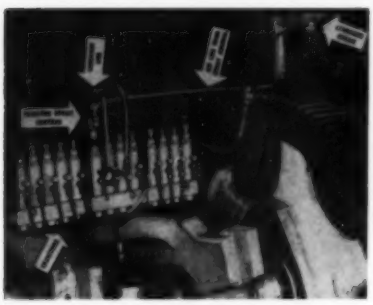
NEW PRODUCTS and equipment

Reply card on page 131 will bring you free literature, editorial clips or more information on new poducts and equipment described or advertised in this issue.

Automatic Mist Lubricator

. . . for open gears

The spray control valve operates automatically with centralized lubrication systems. The valve may be assembled to any lubricant injector in the centralized system, mounted adjacent to or remote from gears to be lubricated.



As the injector begins to discharge lubricant, movement of the injector indicator stem permits the spray control valve to open. This allows regulated air to pass the spray nozzle, atomizing lubricant into a fine, uniform mist of air and lubricant. Lincoln Engineering Co.

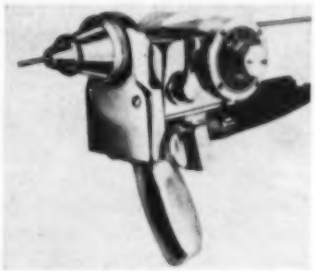
FOR MORE DATA CIRCLE REPLY CARD NO. 1

Metallizing Gun

. . . performs all operations

The unit has a magnetic controlled governor to control turbine power using 60 psi air with a wire speed range from 2½ in. per minute up to 20 fpm. Sealed taper valves on both sides eliminate contamination and prevent the possibility of backfire. It is self-adjusting.

The Turbo-Jet has been designed to spray a fine, dense coating using wire from 20 gage to 3/16 in. in diameter from the highest melting point molybdenum to the lowest melting point wires. It will spray both hard and soft metals and



will operate on acetylene, propane or natural gas. Metallizing Co. of America.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

A-C Welder

. . . for high speed production

Consisting of NEMA rated 300, 400 and 500 amp models, the welders feature stepless current con-

trol, silicone insulation and aluminum coil windings. They are equipped with a large current scale. Accurate fingertip current adjustment and quieter operation are made possible as the coil supports float in a special rubber bushing.

Wide current ranges enable them to be used on practically all industrial jobs, ranging from light duty, low current, to heavy-duty, high current welding jobs. They are especially suited for heavy section welding where high current is desirable and when arc blow would otherwise cut welding speed and quality. General Electric Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Flame Cutting Machine

. . . portable

It weighs only 16 lb and will cut in a straight line or bevel. Circles and shapes can be cut with

equal ease on metal ranging from ⅛ in. to 4 in. It's powered by a 110 volt, 60 cycle motor.

Ease and simplicity of operation are featured. Burdett Oxygen Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Drill Press

. . . 14 inches

New features of the Delta Power Division's press are: A streamlined full-length belt guard, which is hinged at the rear and can be swung out of the way; new side opening for facilitating spindle removal; new set screw arrangement locking stop rod collar or accessories firmly to quill; handle balls on feed lever to increase operator comfort and safety.

It is designed to accommodate a

push button starter in front where centralized controls are desired for

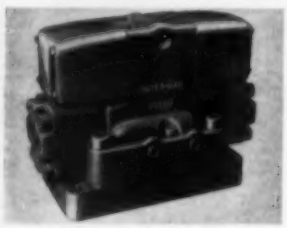
easier operation. It's recessed to prevent accidental starts. Rockwell Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

Four-Way Valves

. . . solenoid controlled

Pilot operated, pressure can be external or internal. Change-over is made by rotating the valve 180 degrees. A choice of spool types and spool positioning provides all the combinations needed for a wide range of applications.



The valves are interchangeable with comparable valves, to provide all porting and positioning arrangements in circuits up to 3000 psi. Denison Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 6

Fork Roll-Over Box

. . . for red-hot forgings

This tierable, heat resistant box will handle forgings without warping. Corrugated, it is made from 7 gage, high tensile, low alloy. The hot-rolled steel is of deep drawing quality. Sides and bottom are perforated for uniform heat dissipation.

Boxes are handled by fork truck or crane. Slots in the sides of the channels permit four-way fork

entry. Riveted crane lugs allow safe overhead handling. The box is 33 x 48 x 24 in., weighs 465 lb and will hold 6000 lb of forgings. Union Metal Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Work-Shop on Wheels

. . . with several extras

Powered with a geared-down Briggs & Stratton 1½ hp gasoline engine, the Shopmobile boasts: An

automatic rewind starting cord, plus a steering handle that steers and actuates the clutch when lowered to moving position, de-clutches when raised and applies the parking brake when returned to vertical position. The clutch can be disengaged with the control on the steering handle.

Unit will carry 800 lb of tools and material. Work bench surfaces of checker plate steel are provided at working height on top of side compartments. They may be fitted with vises, etc. Stahl Metal Products Inc.

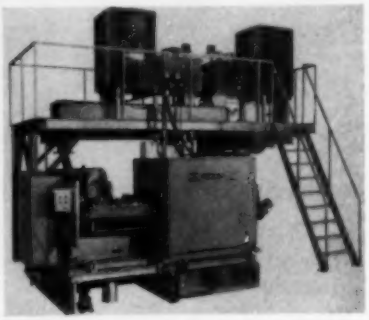
FOR MORE DATA CIRCLE REPLY CARD NO. 8

Shell Molding Machine

. . . completely automatic

Built for continuous, high-production operation, it will turn out forty 22 x 28 in. shells per hour. It is electrically driven, except for the air operated drum box latch and the stripper unit. Timing for pattern preheat, dwell time and cure can be easily controlled from a range of 0 to 120 seconds.

Refinements are: Elimination of springs in pattern assembly; sand bridge in investment box to achieve



a vertical-drop effect; constant supply of mix in hopper to assure compact high-density shells. Mechanical Handling Systems Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 9

Cold Roll Forming Machine

. . . special-purpose design

No. OOx cold roll forming machine with No. 2LS coiler and cutoff is designed for producing cooling fins used on sealed refrigerator compressor units.

Cutting stroke of the shear is activated by a single-acting hydraulic cylinder and returned by spring action. A cyclomonitor controls the number of rings per coil and cutoff is adjustable for coil diameter. Kane & Roach Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

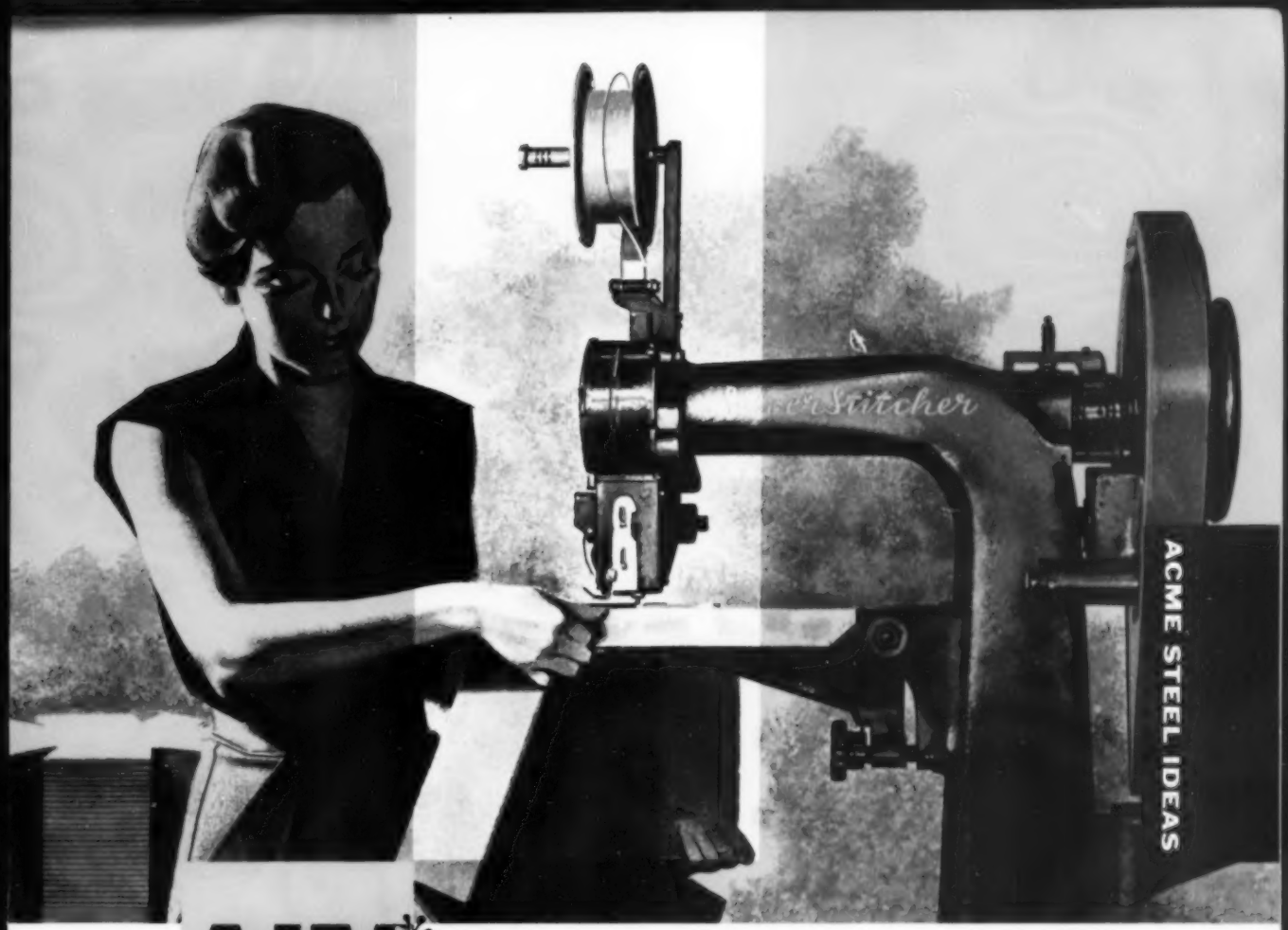
Gear Classifiers

. . . conveyor type

These 3-Way classifiers separate gears into acceptable, salvageable

and nonsalvageable categories. It will handle wide-face and cluster gears.

If the gears meet size specifications, they continue along the conveyor until they are unloaded. If not, a master gear provides the signal source actuating a rejection



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for safe, lower-cost shipping and packaging

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to help solve your problems

Apply advanced Acme Steel Wire Stitching and Steel Strapping Ideas to your shipping operations

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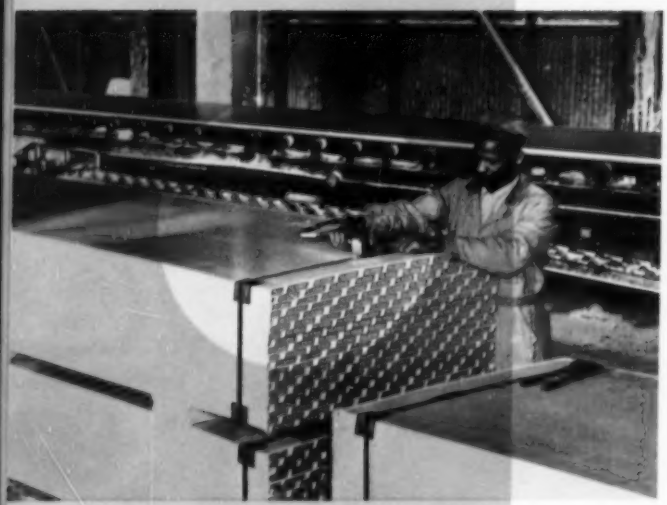
Broadly across industry, Acme Steel continues to develop new and better ways of packaging and shipping with Acme Steel Wire Stitching and Acme Steel Strapping. It's because Acme Steel is an *idea organization.*

It's easy to get an Acme Idea Man to work with you . . . study your problems . . . figure a way to save shipping dollars at both ends of the line.

ACME STEEL

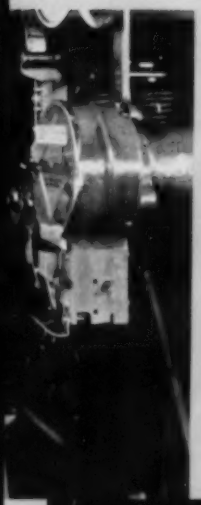


Idea #424—Acme Steel Pneumatic Stretchers tension the strapping on three-ton bundles of wallboard at Newark Plaster Co., South Kearny, N. J. Bundles are firmly secured . . . shipped without pallets.

AIM for better product protection with Acme Steel packaging and shipping ideas

Idea #427—Millions of printed and lithographed boxes, secured by Acme Steel Strapping in disposable pallet containers by Lord Baltimore Press, arrive damage-free at their destinations.

Idea #429—Acme Steel Strapping assures safe delivery of perishables—reduces pilferage, saves time and money for the E. M. Niles Company of Boston, Mass.



Idea #436—Recent conversion to the new Acme Steel ARCUATE Wire method on Acme Silverstitchers has brought about greater packaging and shipping efficiencies for The Gates Rubber Company of Denver.

Idea #437—Bulky, hard-to-handle hydraulic brake assemblies are conveniently palletized and secured by Acme Steel Strapping for in-transit protection. Wagner Electric Corporation of St. Louis saves on storage space—packaging costs.

Idea #435—A prominent manufacturer of refractories, uses Acme Steel Strapping to strap various sizes of bricks into neat, palletized bundles for easy handling—less breakage.

AIM *For Safe, Lower-Cost Shipping*

ask your **A**cme **I**dea **M**an
to apply these ideas to your
shipping problems . . .

Idea #414—Use of pneumatic stretcher for strapping palletized ingots.

Idea #113—Strapping dies for paperboard cartons

Idea #126—End stack bracing for carload shipments of case goods

Idea #411—Self-palletizing of brick

Idea #124—Strapping regular slotted containers, end flaps folded last

Idea #115—Bundling glazed storm windows

Idea #410—Strapping compressed bundles of textiles

Idea #130—Bundling mounted tires for export

Idea #122—Carload bracing of empty cable reels

Idea #407—Palletizing fibreboard

Idea #128—Reinforcement of wood pallets

Idea #104—Palletizing and carloading wax slabs

Idea #415—Strapping formed, wood pipe staves in carload shipments

Idea #401—Unitizing lumber for retail delivery

Idea #105—Palletizing and carload bracing multi-packs of television tubes

Idea #111—Bundling solid fibre newsprint cores

Idea #108—Skid loading cellophane rolls in carton

Idea #107—Carload bracing coiled copper rod

Idea #408—Packaging of impregnated pipe

Idea #133—Tying protective wrappings to oxygen cylinders

Idea #109—Bundling and truck loading bee hives

Idea #110—Strapping rubber onto skids, into palletless units, and carloads

Idea #402—Strapping rolls of tire cord fabric for overseas shipping

Idea #418—Wire stitching of fibreboard tote boxes

Idea #112—Strapping foundry flasks into bundles

Idea #409—Strapping concrete pipe on flat cars

Idea #131—Bundling refractory brick for palletless shipment

Idea #123—Self-palletizing unit of concrete block

Idea #416—Protection-line strapping of cartons

Idea #129—Skid loading printed material

Idea #125—Reinforcement of crates for five-gallon water bottles

Idea #403—Assembling and stitching various size cartons

Idea #127—Carloading mixed shipment of kegs and cases of beer

Idea #417—Unitizing heavy, shaped timbers

ACME STEEL

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Take the opportunity now to tap over 70 years' experience in problem-solving through your Acme Idea Man. Acme Steel knowledge, plus advanced Acme Steel Strapping Tools and Wire Stitching Machines, is always available when you need it.

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RECOMMENDING specifically the methods that will provide the greatest savings to you and your customers.

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Please send me further information on Acme Steel's Safe, Lower-Cost Shipping Methods. I am interested in ☐ Steel Strapping; ☐ Wire Stitching; ☐ having an Acme Idea Man call on me.

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

AIM FOR SAFE, LOWER-COST SHIPPING AND PACKAGING WITH ACME STEEL WIRE STITCHING AND STEEL STRAPPING IDEAS— MAIL THE COUPON TODAY!

ACME STEEL

gate and gear is swept into the salvageable or the nonsalvageable chute.

The classifier will check all gears coming from the highest speed production line. It will turn off a gear producing machine should consistent gear size errors be detected. Michigan Tool Co.

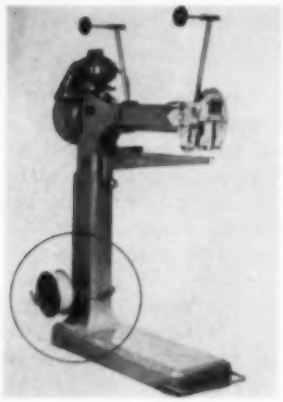
FOR MORE DATA CIRCLE REPLY CARD NO. 11

Coil Holders

. . . for stitching machines

Wire stitching operations are said to be improved by this 50 lb holder. The model P1C was developed for single-head and double-head box stitchers to allow longer stitching runs and shorter stops to reload. It is to be mounted on the machine.

Design of coil holder cuts down



on maintenance. The controlled brake is self-adjusting. Wire feeds easily from the holder. Tangle is eliminated. Acme Steel Co.

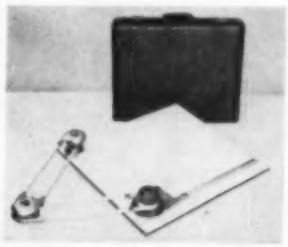
FOR MORE DATA CIRCLE REPLY CARD NO. 12

Drafting System

. . . completely portable

The Universal Desk - Topper Drafting & Layout Machine includes: A drafting machine with a capacity of 22 x 34 x 9 in.; a 15 in. engine-divided aluminum alloy scale; a folding board equipped with folding legs and rubber feet that (when opened) accommodates drawings up to 17 x 22 in.; a box for instruments; and a tracing paper dispenser and a carrying carton.

It has all the features of full-size drafting machines. With an accessory "C" clamp, the machine



may be mounted on larger drawing boards. Universal Drafting Machine Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Catalyst Spray Gun

. . . assures uniform mixture

Designed to simultaneously spray plastic resin and catalyst, it has a single pressure control for resin

and double pressure control for catalyst. Dual atomizing air pressure control is said to insure uniform results regardless of main line pressure variation.

Resin is fed to the gun through the fluid line, catalyst through the air stream. The gun has one head. When the trigger is actuated, catalyst and resin meet outside of the air cap atomizing uniformly so the correct amount is applied to the surface. DeVilbiss Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Carbide Tool Grinder

. . . operates at 10,800 rpm

High-velocity and single point HI-V combines rough and finish grinds into one, high-speed operation. Use of ultra high speed with a nickel bond diamond wheel and a special fluid to limit energy absorption in the wheel applies about 95 per cent of the energy developed to the carbide tool face.

The grinder was made practical with the advent of the all-metallic grinding wheel. Diamonds are bonded by pure nickel, which is electrolytically deposited. The hazard of wheel breakage at high ve-

locity is said to be eliminated. The machine was developed jointly with the Ohio Metal Working Products. Metalloid Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Cut-Off Wheel

. . . cuts wire rope

Rope of all sizes can be cut easily and quickly without deforming or unraveling the individual wires with this reinforced resinoid wheel.

The wheel is a 16 x 5/32 x 1 in.,

A24-V10BN, resinoid Norflex. It operates at 3425 rpm and combines strength and safety. Norton Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

Iron Powder Electrode

. . . virtually self-cleaning

The SW-44, announced by the Welding Products Division, will enable the industrial user to deposit more E-6012 type weld metal. It'll also eliminate a lot of clean-

ing. There is good wash-up with no undercut. Bead appearance is smooth with fine ripples.

Re-striking is easy even with a completely cooled rod. A. O. Smith Corp.

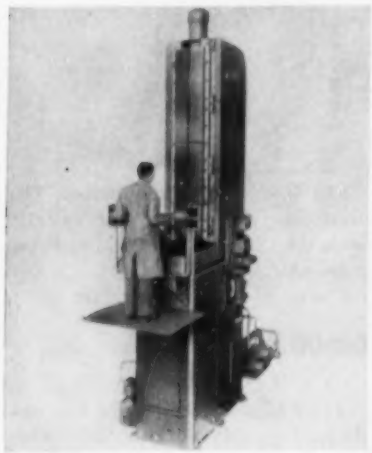
FOR MORE DATA CIRCLE REPLY CARD NO. 17

Surface Broaching Machine

. . . vertical, hydraulic

This machine has a 90-in. stroke and 15-ton work capacity. It can be had as a single or dual ram unit.

Specifications of the ram unit



illustrated are: Variable broaching speed of 5 to 30 fpm, return speed of 60 fpm, approximately 9 ft of working height, an over-all height of 19 ft. Floor space is 6 x 12 ft and net weight is about 30,000 lb. American Broach & Machine Co.

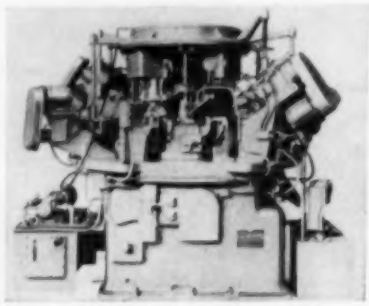
FOR MORE DATA CIRCLE REPLY CARD NO. 18

Mass Production Machine

. . . 23 operations on one part

The machine drills, reams, countersinks, taps and spot faces a variety of angular, vertical and horizontal holes in the carburetor air horn die casting. There are six rack-fed auxiliary heads mounted on a platen that surrounds the indexing load table. The auxiliary heads perform horizontal and angular operations.

The machine is an adaption of the 67S design. A standard base, indexing table, center column, straight and angular drilling heads, cooling and hydraulic systems are combined in this machine. It's engineered to do a special job



with a minimum of special tooling. Morris Machine Tool Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 19

Walkie Truck

. . . dual purpose unit

Maximum height can be made to meet user's specifications. Truck has two speeds for forward and backward movement. As a safety factor, only slow speed is possible

once the lift is over 4 ft in the air.

Power is supplied by a 12-volt battery. Four-point load suspension insures truck stabilization.

The truck can be used for maintenance operations, as well as a Hi-Lift for stacking. Complete controls go up with the operator. Moto-Truc Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 20

Chemical Line

. . . increased applications

The Fosbond line has been increased to include all chemicals necessary to apply iron or zinc phosphate coatings to steel or zinc.

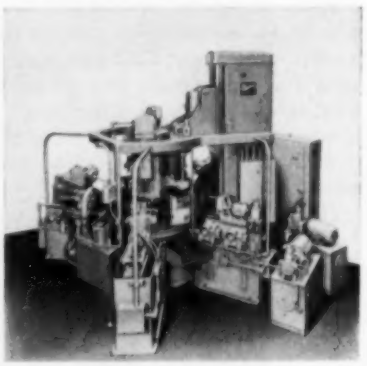
Used in all fields where metals are painted, this line is said to provide durable coatings through fast, trouble-free processing operations on surfaces previously considered uneconomical to be coated because of the time factor involved. Pennsylvania Salt Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 21

Machine Tool

. . . six stations

This 8-way, center-column tool is hydraulically-fed with a mul-



tiple spindle. It features a 3-spindle power wrench with individual torque control to actuate fixture clamping mechanism, as well as movable bushing plate.

Besides drilling, reaming and counterboring, this machine performs a face-milling operation, which is done with a specially-designed generating tool. Standard features are included. Buhr Machine Tool Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 22

Semi-Automatic Loader

. . . cuts to three operations

This machine offers a low cost method of increasing production

rates of standard Red Ring rotary gear shaving machines. It includes tailstock and splash door air cyl-

Count on WEIRTON

HIGH-CARBON STRIP
COLD-ROLLED SPRING STEEL

for uniform high-speed blanking and cold forming

Whether your problem is cold forming or blanking, you can depend on Weirton cold-rolled spring steel for best results. It has proved itself in a multitude of applications by consistently meeting the requirements of a variety of products where high fatigue-resistance is a principal factor.

Where superior forming qualities are of prime necessity, Weirton supplies spheroidized-annealed cold-rolled spring steel. The controlled grain structure provides exceptional ductility—assuring you of simple, economical fabrication.

Weirton also supplies cold-rolled spring steel that is temper rolled to produce controlled ranges of hardness and tensile strength. The desired ranges are designed to meet your specific requirements—assuring you of clean, economical blanking.

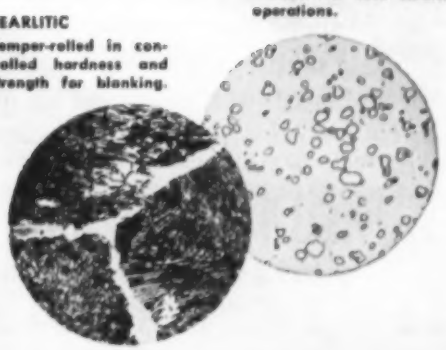
Close manufacturing control has resulted in these highly desirable qualities—unique in Weirton high carbon strip:

- ***Accurate response to heat treatment.***
- ***Uniformity of gauge and width.***
- ***Uniform chemical and physical properties.***
- ***Exact consistency of grain structure.***
- ***Controlled decarburization limits.***

Weirton high carbon strip is available with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

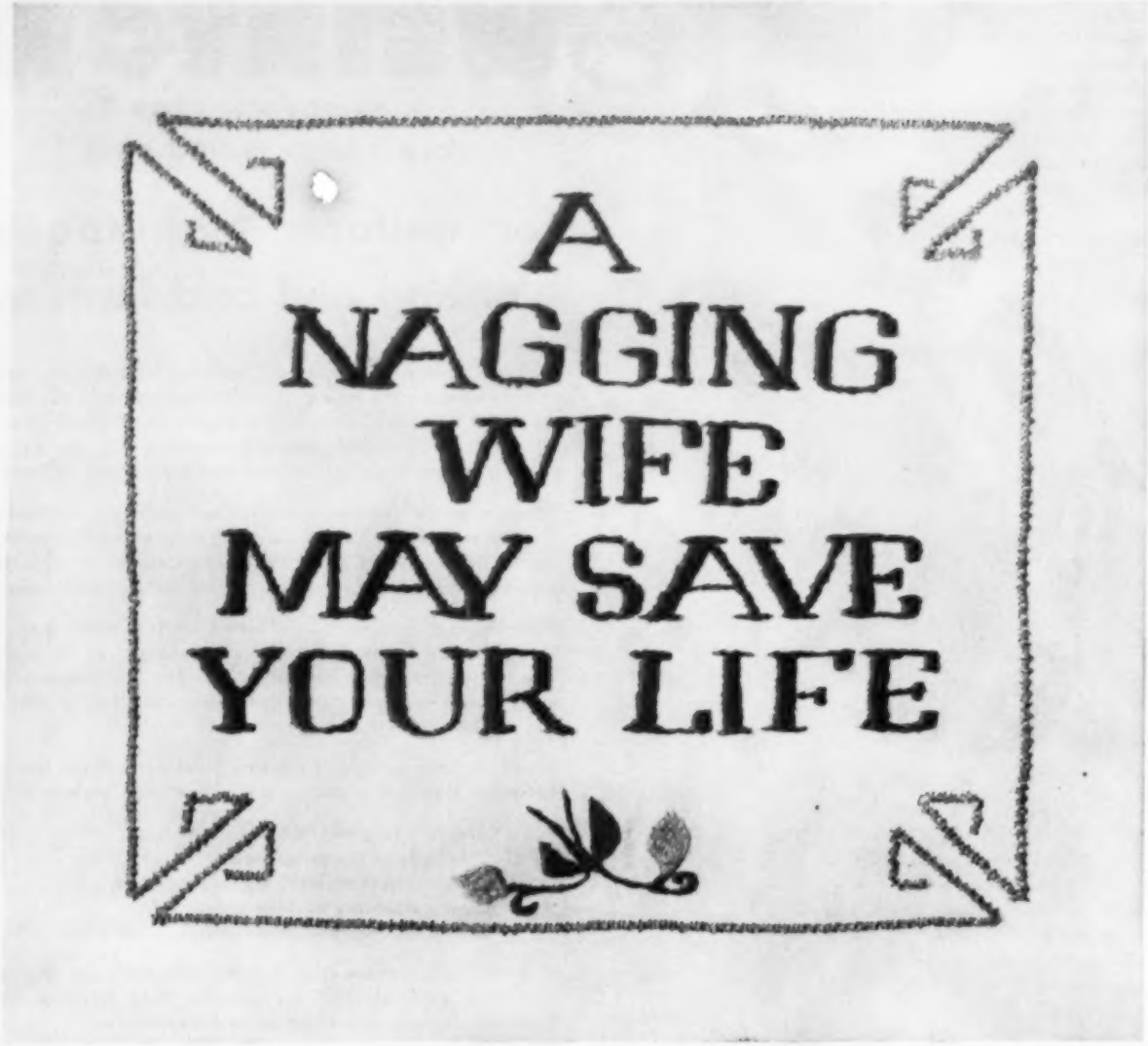
SPHEROIDIZED
Annealed, soft and ductile —ideal for cold forming operations.

PEARLITIC
Temper-rolled in controlled hardness and strength for blanking.



WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



IF YOU ARE OVER 45 and your wife keeps insisting that you should have *two* chest x-rays every year . . . don't blame her. *Thank* her! Semi-annual chest x-rays (no matter how well you *feel*) are the best "insurance" you can have against death from lung cancer.

The cold fact is that lung cancer has increased so alarmingly that today you are six times more likely to develop lung cancer than a man of your age twenty years ago. Our doctors know that their chances of saving your life could be as much as ten times greater if they could only detect lung cancer before it "talks" . . . before you notice any symptom in yourself. That's why we urge you and every man over 45 to make semi-annual chest x-rays a habit—for *life*.

To see our new life-saving film "The Warning Shadow" call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

American Cancer Society

inder controls, suitable electrical controls and a special work locator.

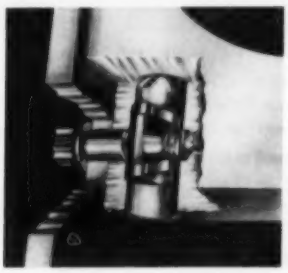
Seven operator functions required to manually load or unload a standard gear shaving machine are reduced to three. Operator safety is promoted by assuring that his hands are kept out of the cutting area during tooth shaving. National Broach & Machine Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 23

High Tensile Barrel Nut

. . . with floating action

It does away with the need for a large wrenching area when joining forgings and other structural members. The self-locking fastener has a light aluminum alloy



base to locate the nut body. It'll withstand up to 180,000 psi at the pitch diameter of the bolt. The ESNA red collar locking principle, using an integral nylon collar smaller in diameter than the major bolt diameter, assures self-locking.

The type 2552 nut is available in eight thread sizes, from ¼-28 through ¾-16. Elastic Stop Nut Corp. of America.

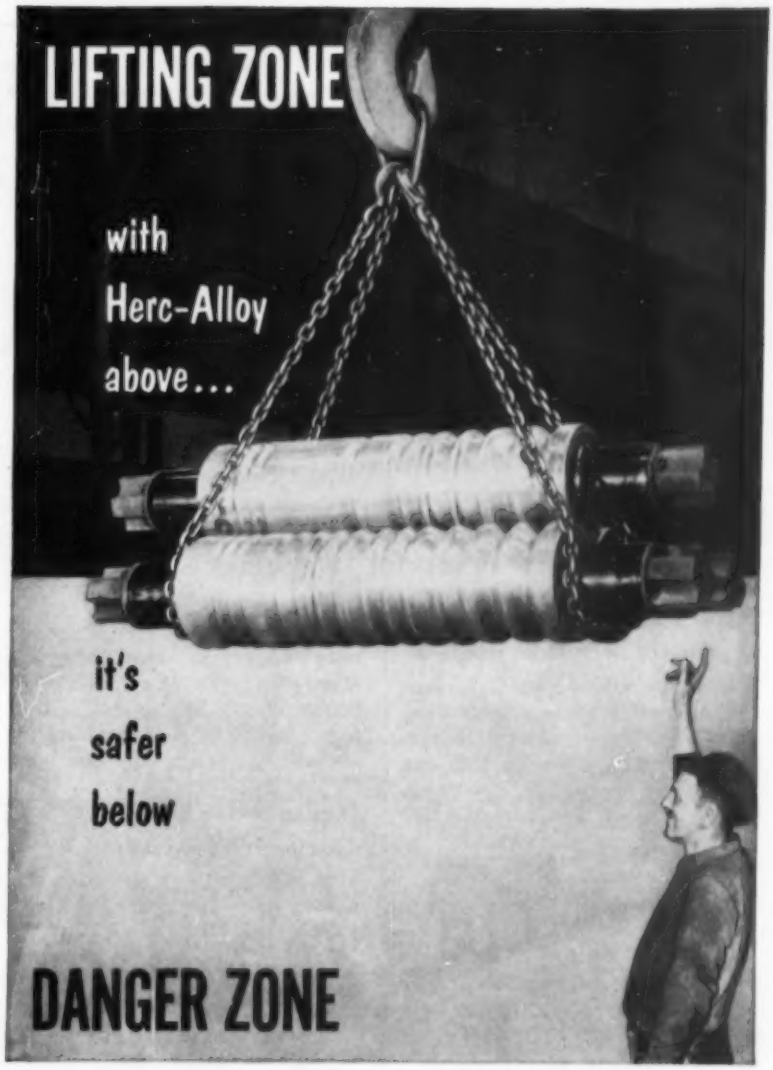
FOR MORE DATA CIRCLE REPLY CARD NO. 24

Sliding Sub-Bases

. . . increase versatility

These sub-bases are introduced by the Drill Unit Division as an accessory for increasing the versatility of their standard air-hydraulic drill units. Their use makes it possible for special-purpose machines (incorporating Rockwell drill units) to be built so that the units themselves can be moved forward or back with relation to the parent machine without loss of machine alignment.

This feature facilitates removal



SPECIFY

HERC-ALLOY

SLING CHAINS

Write for Data Book

HERC-ALLOY

Sling Chains are registered by individual serial number and can be rebuilt or replaced at any time to original specifications.

The Allegheny Ludlum Steel Corp., pictured above, uses Herc-Alloy Sling Chains for hundreds of tough lifting jobs in its plants. In addition to maximum safety, Allegheny Ludlum also enjoys the extra economy of longer-lasting Herc-Alloy. These sling chains offer still another advantage...a weight reduction unmatched by any other alloy chain without any sacrifice in tensile strength. This reduces worker fatigue. All things considered, don't you think Herc-Alloy Sling Chains are worth a try in your plant.

CM HOISTS AND CHAIN

COLUMBUS McKINNON

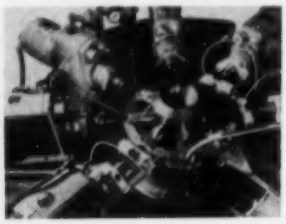
CHAIN CORPORATION

TONAWANDA, NEW YORK

DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND

In Canada: McKINNON COLUMBUS CHAIN LIMITED, ST. CATHARINES, ONTARIO

and replacement of tools, greatly reducing time expenditures for tool changes, repair, etc. Adequate length of travel is allowed



for in each of the three sub-base models: 4⅛ in. for small model, 6 in. for the two larger sizes. Rockwell Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 25

Power Inserting Tool

. . . installs on a large scale

This tool drives inserts to provide internal threads in sizes from No. 6 to ¼ in., national, coarse and fine. The inserting tool can be powered by air or electricity. It can be used as a portable tool

or held in a drill press or universal tool holder.

The depth of drive, or placement of the insert in the hole, can be controlled within 0.008 in. by quarter turns of the adjusting sleeve. An automatic clutch disengages the driving mandrel when correct depth is reached. Heli-Coil Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 26

Telescopic Mast

. . . for fork-truck use

Fork elevation of the SpaceMaster electric is increased to 222 in. Collapsed height is 105 in. The extra lift is obtained by adding an extra section to the standard tele-

scopic mast section. Capacity of the truck, which is lengthened 9 in., is reduced about 1000 lb.

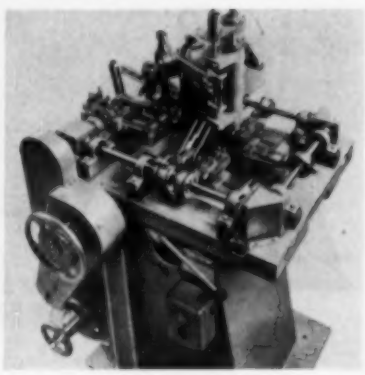
The added lifting height permits higher than average stacking. More storage space within a warehouse is utilized to full advantage. Lewis-Shepard Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 27

Torsion Spring Winder

. . . large tooling area

W-3001 weighs 1300 lb with base measurement of 34 x 38 in.



It is capable of handling up to ten turns of 0.080-in. wire and features a 12 x 18 in. tooling area.

Driven by a motorized variable speed transmission and V-belt drive, it is equipped with two sizes of slide feeds; one handles up to 3½ in. of wire, the second feeding wire ranging up to 6¼ in. in length. They are equipped with gears for 10 and 24 turns of the spindle. A set of gears for 47 turns is available. Torrington Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 28

Drum Carrier

. . . driver seat controlled

Designed to be controlled completely from the driver's seat, this drum clamp lifts and transports one, two or four drums at one time. Special curved, pivot-mounted arms, with ribbed rubber gripping surfaces, assure a safe hold and maximum protection.

Quickly interchangeable with other Towmotor clamps, this drum clamp is controlled by hydraulic operating mechanism. Towmotor Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 29

Fork Lift Truck

. . . 4-wheel suspension

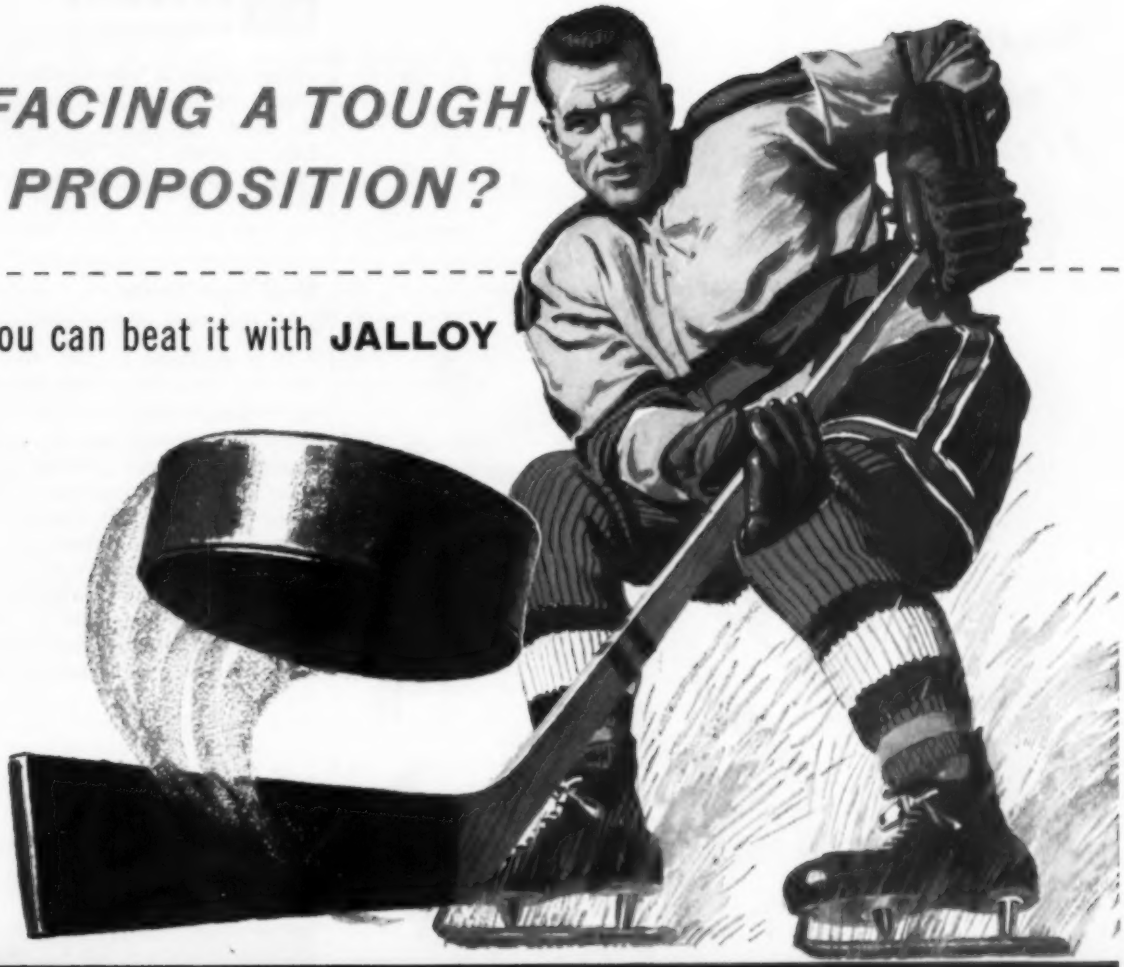
This truck has a low center of gravity for greater stability and

safety. It has rated capacities from 1000 up to 3000 lb. Two studs on the Docker's uprights are provided to pull or drag loads too heavy to be lifted. Operating controls are located in the rear, allowing the operator easy accessibility from either side of the truck.

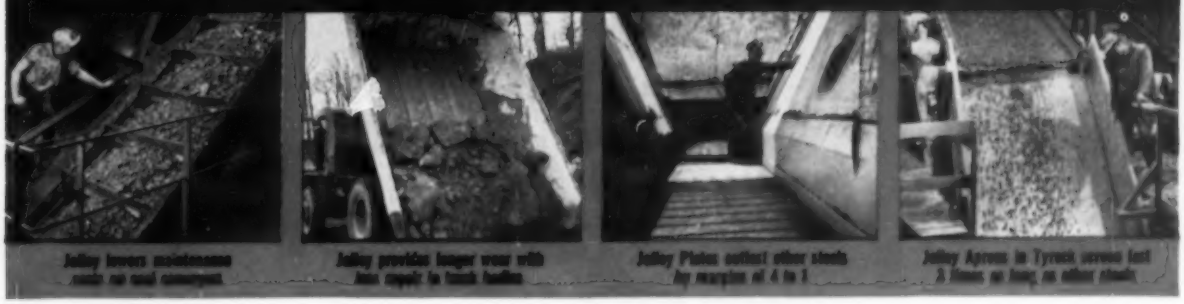
It is available with either monolift or duo-lift uprights. The ram arrangements on both are directly

FACING A TOUGH PROPOSITION?

you can beat it with **JALLOY**



J&L JALLOY HEAT-TREATED PLATE BEATS WEAR DUE TO ABRASION



J&L Jalloy Heat-Treated Plate is the special purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded.

Jalloy is available in three grades to meet various service requirements.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 404, Pittsburgh 30, Pa.

☐ Please mail complete data concerning Jalloy.
☐ Please have your representative call.

Name _____ Title _____

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for a fabulous finish . . .

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ABRASIVE BELTS

for grinding, sanding, polishing — metal, wood, leather, plastics, rubber.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
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Massachusetts

NEW PRODUCTS and equipment

interchangeable. Conversions into either lift system may be done in the field. Lift speed of 45 to 65 fpm, depending on load, is featured. Automatic Transportation Co.

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Shell-Type Welder

. . . for heavy-duty production

It is available in 300, 400 and 500-amp sizes for a wide range of ac welding production jobs.

Frame core and case are welded steel. It has no moving parts. Core and coils are anchored in place for quiet and trouble free operation. It is capacitor equipped for power factor correction. Shell transformer design and use of special steel in cores make for high efficiency. Three wheeled portable mounting is optional. Hobart Bros. Co.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Siding

. . . ribbed, aluminum

This industrial siding offers high quality of appearance for low cost

industrial buildings. Intended primarily for frame-type structures, it can be used as a facing sheet on concrete block buildings.

Conventional fastening methods are recommended for application. It is available in 0.032-in. thickness, from 5 to 18-ft lengths in 6-in. increments. Aluminum Co. of America.

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FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Chipless Machining

Michigan Tool Co. covers the Roto-Flo process of cold-forming splines, serrations and other similar external shapes—Bulletin RF-54, 6 pages.

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Turret Lathe Catalog

Warner & Swasey Co. has released the seventh edition of its turret lathe catalog, which illustrates their standard tools, chucks, collets, etc.—197 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Pressure Filters

Permutit Co. offers a comprehensive description of their line of pressure filters and accessories for those dealing with water problems—Bulletin No. 2225B, 15 pages.

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Automatic Controlling

Bristol Co. covers its complete line of recording automatic controlling and telemetering instruments—Bulletin DMO35.

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Air Vent Valves

Handy & Harman offers a description of Flair Mfg. Corp.'s air vent valves for steam and hot water systems—No. 66, 4 pages.

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Coolant Filters

Barnes Drill Co. illustrates and describes the Kleenall combination magnetic and fabric filters. A guide for selecting cleaning equipment is included—Bulletin 350C, 15 pages.

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Welding

Hobart Brothers Co.'s "Hobart Arc Welding News" contains a wide selection of photos and articles on welding—Vol. XI, No. 3.

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Zinc

St. Joseph Lead Co.'s "Bunker Hill Zinc and Die Casting" contains: Technical data on the role of zinc as a base metal for die casting alloys; the variety of commercial finishes that may be applied; and how the castings are used—24 pages.

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Filters

Mechanical Industries Inc. details the Dorfan Impingo Filter for cleaning hot, wet and corrosive gases and air—Bulletin No. 4, 8 pages.

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Pumps, Valves

Simplex Engineering Co. describes the fluid power pumps and valves together with the complete power packages. Five models are covered in detail, illustrations included—Bulletin G, 7 pages.

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Applied Magnetics

Indiana Steel Products Co.'s house organ contains a "how-to" discussion on testing magnets—Vol. 2, No. 5.

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Eccentric Geared Presses

Niagara Machine & Tool Works introduces a ruggedly-constructed line of straight side, single action, eccentric geared presses (Series SE-1, 2, 4)—Bulletin 66, 27 pages.

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Surface Finish Control

Brush Electronics Co. explains how surface finish control can reduce machining costs, increase production capacity and improve your product—7 pages.

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High Speed Threader

Waterbury Farrel Foundry & Machine Co. details the thread roll-

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ing machine, which uses planetary dies to thread up to 2000 blanks a minute—Circular No. 942-A, 4 pages.

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Power Presses

Kenco Mfg. Co.'s brochure gives technical information on the latest 4 and 5-ton, deep-throated presses.

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Conveyors

Metzgar Conveyor Co.'s catalog will help you select mechanical handling equipment to fit your needs—Catalog No. 54, 36 pages.

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Battery Maintenance

Gould-National Batteries Inc. offers a technical training manual on lead-acid storage batteries for electric industrial truck use—44 pages.

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Safety Guards

Harrington & King Perforating Co. illustrates a simple, inexpensive way of making your own guards for fly wheels, gears, belts and other moving parts—6 pages.

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Combination Press

Stanley H. Holmes Co. offers a specifications manual for its combination hydraulic forging and straightening press—12 pages.

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Cold Pressure Welding

Utica Drop Forge & Tool Corp. explains their process for cold pressure welding.

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Investment Castings

Scott Casting & Mfg. Co.'s "Basic Design Factors for the Engineer" explains the lost wax process—20 pages.

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Foundry Facilities

Cooper-Bessemer Corp.'s "Controlled Castings" provides details on their foundry facilities for casting gray iron, Meehanite and ductile iron—6 pages.

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Belt Conveyor

Stephens-Adamson Mfg. Co. describes belt conveyor components pre-engineered for customer assembly—Bulletin 1454, 4 pages.

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Tungsten Carbide Dies

Vascoloy-Ramet Corp.'s round and shape die catalog includes complete ordering information on al V-R dies—Die Catalog VR-461, 6 pages.

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Industrial Furnace Fixtures

Standard Alloy Co. Inc. tabulates standard heat and corrosion resisting alloys recommended for trays, boxes and fixtures—Bulletin No. 6, 4 pages.

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Cooling Tower

Fluor Corp. Ltd. details the construction of cooling towers and their application in "Cooling Water for Industry"—36 pages.

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EDITORIAL REPRINTS:

Drill, Rivet Titanium

Tests at Ryan Aeronautical Co. show that commercially pure titanium sheet stock can be drilled and riveted satisfactorily if adequate tools and procedures are used, p. 96

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Executive Compensation

On p. 52 you'll find a run-down of the trends in executive compensation. Emphasized is the fact that knowing how to pay them is as important as how much.

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Induction Heat Treatment

No. 10 in STEEL's Modern Heat Treating Series, p. 92, says selectivity is teaming up with versatility. Big push back of induction hardening is modern design.

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Fleet Operations

Maybe you're not getting the the most out of your fleet. Here are some helpful tips, p. 60, on how to put efficiency into your operations.

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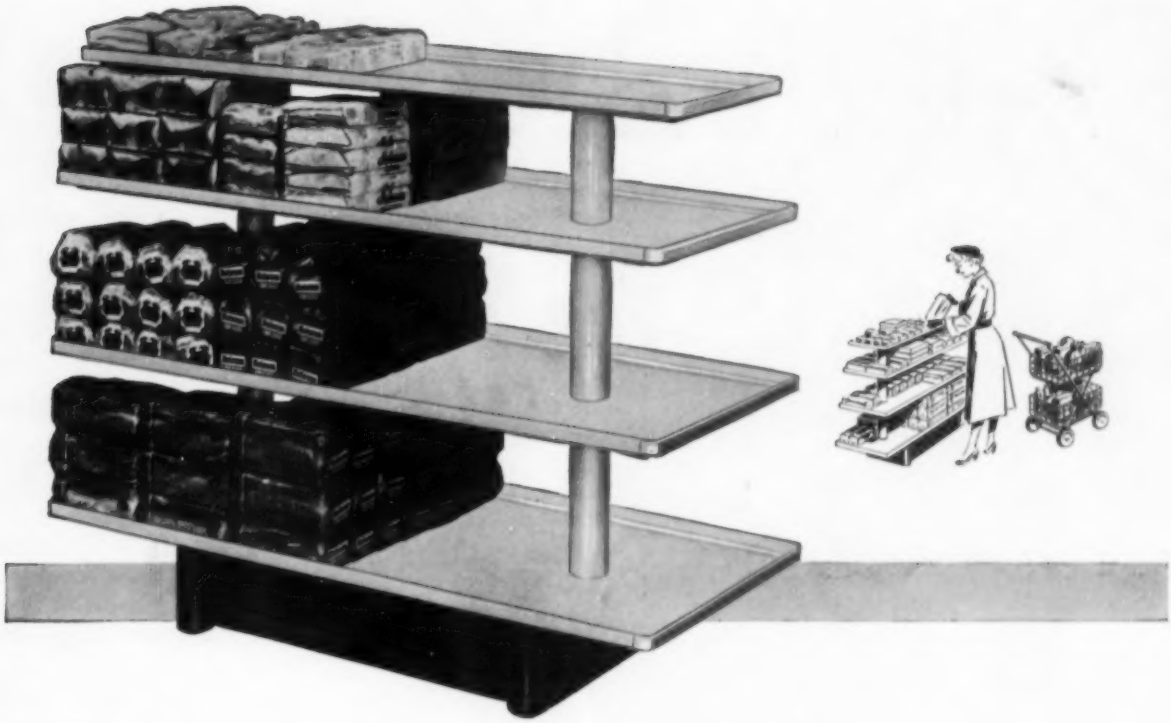

The finish was only the beginning

A baked-enamel finish applied to Republic Electro Paintlok was the beginning of customer-attracting appearance and longer service life for this bakery goods display. The unit is made by Modern Metal Products Company, Greensboro, N. C.

Electro Paintlok is the zinc-plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them for years.

Selection of Electro Paintlok for this application was based on the company's success in fabricating it for other products. They knew the tight zinc coating would not crack, peel or flake during normal fabricating operations. They also knew their entire finishing operation would be speeded.

Electro Paintlok requires no special cleaning—only the removal of finger marks and warehouse dirt. The surfaces require no pre-etching. They are pre-conditioned for application of the baked-enamel finish.

Why not consider Republic Electro Paintlok for making your fabricated steel products more attractive, more serviceable, at less cost?

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

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ELECTRO ZINC PLATED SHEETS
ELECTRO PAINTLOK • ELECTRO ZINCBOND

Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron

Whatever you roll...

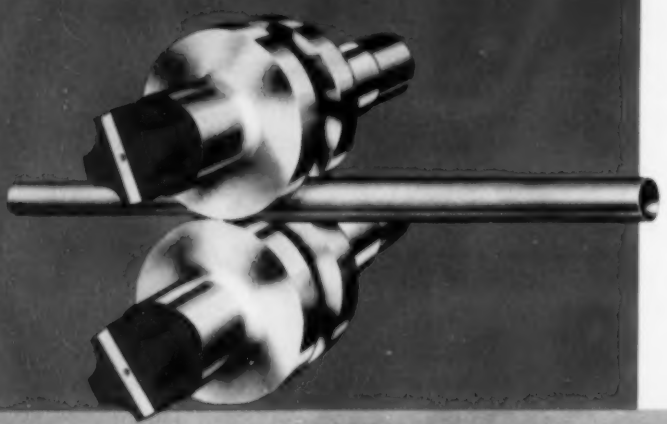
MACK-HEMP

STRIPED RED WABBLER ROLLS

fit the mill—and fill the bill

Take Mack-Hemp's specialized roll making experience signalized by many firsts in metallurgical and manufacturing advances—and you get rolls that do the job better and faster, stand up longer and turn out products of the quality you are proud to stamp with your name.

Combine it with Mack-Hemp's 150 years of Know-How service to the metals industries with the skill of your own engineers and you get assured productioneering that pays off in your rolling mills.



It's a good habit to always keep an eye on what's new and different at Mack-Hemp.

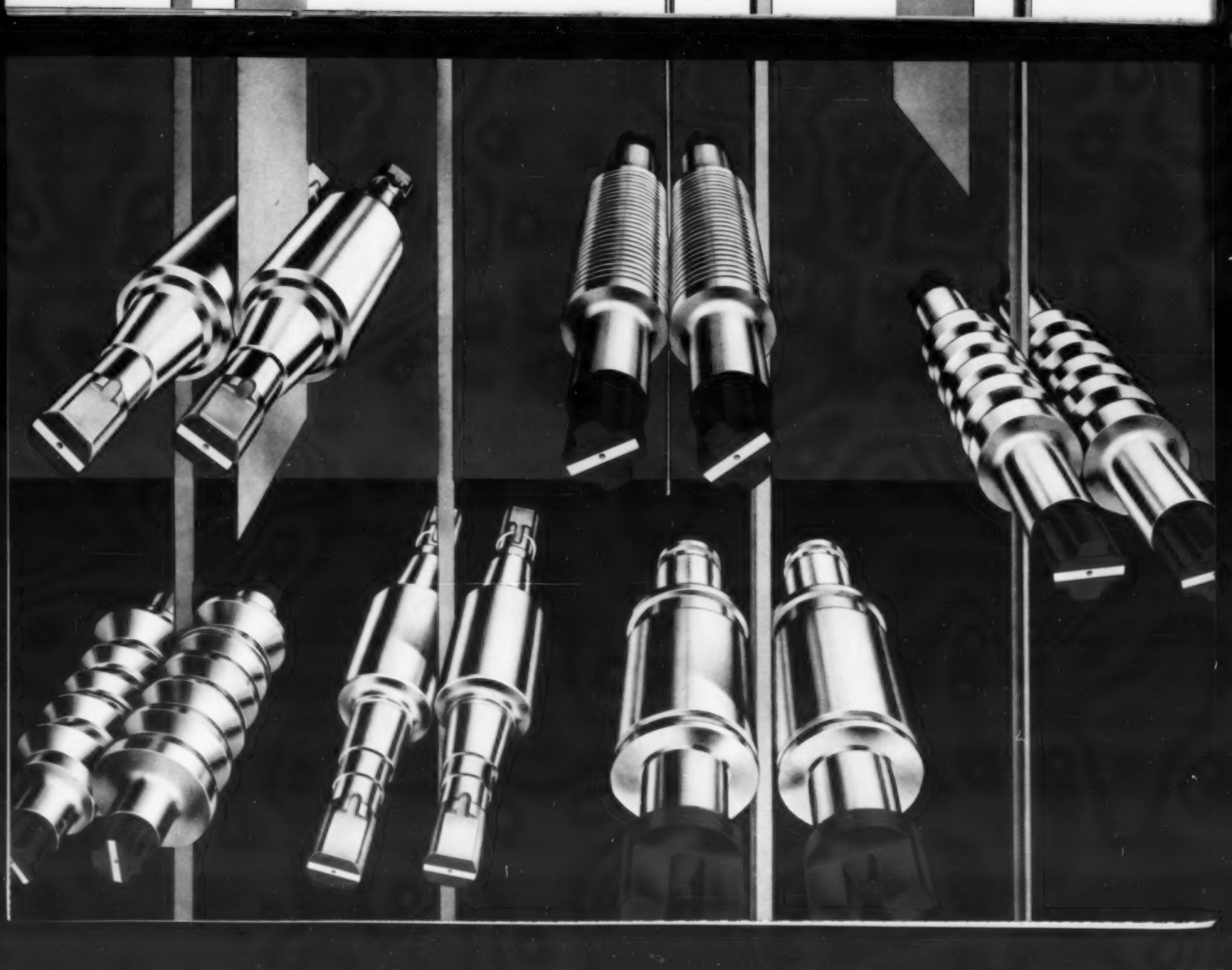
MACKINTOSH-HEMPHILL
COMPANY

Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL COMPANY · PITTSBURGH U.S.A. · MH

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . Improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners—electronically controlled contouring lathes—screw feed roll turning lathes—heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills.



"Now, to put it together for keeps . . . here's the only thing to use . . . BRASS"

YES, father knows best — or at least he knows his fastenings and what makes them hold fast, *and last.* Nothing else but good, *solid* Brass that you can always bank on . . . *Bristol* Brass, for example.

And more and more manufacturers of screws, rivets, pins and other cold formed products are learning of the savings to be had from the remarkable versatility of wire developed by Bristol engineers. Nothing else permits the making of more types of products and heads (round, flat, etc.) from the same stock. Once they try it, manufacturers reorder from Bristol to take advantage of the inventory simplification offered by Bristol Brass wire.

Brass wire has always been a favorite of manufacturers because it is so easy on tools and machines. And many of them specify *Bristol* Brass wire because they find it consistently uniform in gauge, temper and grain-size — and because Bristol's delivery promises *are kept.* See for yourself. Send us a trial specification *now.*

The BRISTOL BRASS CORPORATION has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester, Syracuse. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corporation of Ohio, 1607 Broadway, Dayton.

"Bristol-Fashion" means **Brass at its Best**

Market Outlook

STEEL CONSUMERS are becoming delivery conscious again.

They see the steel production rate going up in response to increased demand, and in some cases they find delivery dates are becoming extended. The biggest consumer—the automobile industry—still insists on quick delivery.

LOOKING FOR BUSINESS—While demand has improved for some products, steel producers still are looking for business. One company that issues a weekly availability report no longer lists products on which deliveries have become extended. The producer is afraid the extended dates will scare customers away.

GOING UP—Reflecting the strengthening in demand, the national steel ingot production rate continues to go up. In the week ended Oct. 17, the fifth consecutive week of rise, the rate climbed to 73.5 per cent of capacity. That's an increase of 2.5 points over the preceding week, making a total gain of 10 points in the last five weeks. The rate now is only 1.5 points below the high point of this year.

With some producers, cold-rolled carbon steel sheets are almost sold out for this quarter. Others can promise delivery in four to five weeks. Orders for hot-rolled carbon sheets are improving only slightly.

TIGHT SPOT—Galvanized sheets are the tightest of all. Continuous hot-dipped galvanized sheets require 14 weeks and more for delivery. Promises on the noncontinuous hot-dipped product also are more extended than they were. One mill which recently was able to offer the lighter gages of it in seven to eight weeks is now quoting 12 weeks. On gages 16 and heavier it is offering delivery in seven weeks, compared with five to six recently. Another maker of the noncontinuous hot-dipped product offers delivery in five to six weeks.

EXTENDED—Electrical sheets and enameling iron sheets also are among the products on which deliveries are the most extended. One important producer is quoting five to six weeks on electrical sheets and four to five weeks on enameling iron. Another maker of enameling sheets is booked into December.

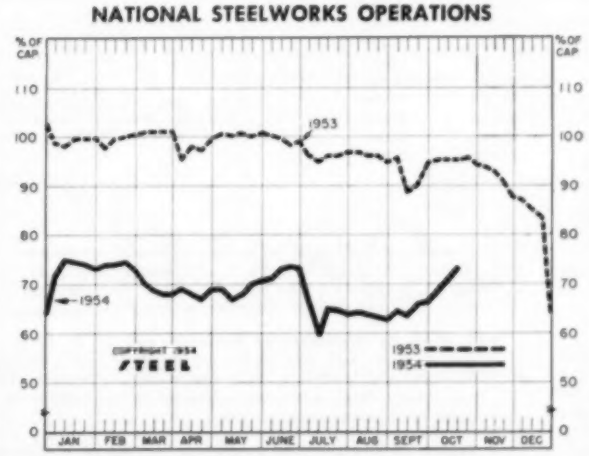
Plates and bars are the weakest in demand among the major steel products. Plates can be had from the mill in two weeks. Both hot-rolled and cold-finished bars can be had promptly.

WINTER VACATION—Structural shapes are in fairly good demand but it is expected to taper off in preparation for winter when construction is restricted by weather.

On the other hand, prospects of demand from the railroad industry are improving slightly. The Pennsylvania Railroad called 300 employees back to its Altoona, Pa., shops to start a program of maintenance and repair of box cars. Baldwin-Lima-Hamilton Corp., Eddystone, Pa., received a government contract to build 50 steam locomotives for shipment to India. The government is expected to order 2500 freight cars for export to that country.

PRICE TRENDS—The steel market remains steady pricewise. STEEL's price composite on finished steel remains at $117.95 a net ton, and its steelmaking scrap price composite holds at $32 a gross ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Oct. 17	Change	Same Week 1953	Same Week 1952
Pittsburgh	70.5	+ 1	98	107
Chicago	74.5	0*	98.5	109.5
Mid-Atlantic	65	+ 2	97	99
Youngstown	72	+12*	105	106
Wheeling	87.5	+ 1	94.5	98
Cleveland	81.5	+ 4	100.5	107.5
Buffalo	70.5	+ 2.5	106.5	106.5
Birmingham	74	0	96.5	102
New England	59	+ 7	89	94
Cincinnati	65.5	— 0.5	80.5	93
St. Louis	76.5	+ 1*	100.5	110
Detroit	83	+ 7	100.5	109.5
Western	88	+ 1	102	104
National Rate	73.5	+ 2.5	95	105.5

INGOT PRODUCTION‡

	Week Ended Oct. 17	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	107.3†	105.3	98.5	135.2
NET TONS (In thousands)	1,724†	1,692	1,583	2,172

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 41 Technical Outlook—p. 91

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Oct. 12 1954	Oct. 5 1954	Month Ago	Sept. Average
(1947-1949=100)	144.7	144.7	144.6	144.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Oct. 12

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	45.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.775
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	5.000
Bars, reinforcing	5.050
Bars, C.F., carbon	6.160
Bars, C.F., alloy	11.275
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.850
Sheets, C.R., carbon	5.871
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.848
Sheets, electrical	$9.350
Strip, C.R., carbon	7.507
Strip, C.R., stainless, 430 (lb)	0.418
Strip, H.R., carbon	5.125
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	8.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.333
Wire, drawn, carbon	7.935
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Oct. 13 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.19	189.38	152.52
Index in cents per lb.	5.270	5.270	5.261	5.130	4.132

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.95	$117.95	$117.77	$115.54	$91.64
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	46.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	32.00	32.00	29.75	32.50	26.75

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Oct. 13 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., del. Philadelphia	4.55	4.55	4.55	5.302	3.83
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95-4.00
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, del., Philadelphia	4.53	4.53	4.53	4.38	3.50
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.226	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.226	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.56	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.96	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.025	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45-5.95	4.00
Strip, C.R., Chicago	6.00	6.00	6.00	5.70	4.00-4.15
Strip, C.R., Detroit	5.60-.90	5.60-.90	5.60-.90	5.45-6.05	4.20-.25
Wire, Basic, Pitts.	5.75	5.75	5.75	5.475-5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.35-6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$8.95	$8.95	$7.75

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, ⅜-⅝" Pitts.	4.675	4.675	4.675	4.525	3.40

PIG IRON, Gross Ton

Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	49.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, del. Phila.	50.16	50.16	50.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) del. Cin.	60.58	60.62	60.62	60.43	45.43
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$32.50	$32.50	$30.50	$36.50	$29.75
No. 1 Heavy Melt, E. Pa.	30.50	30.50	28.75	31.50	25.00
No. 1 Heavy Melt, Chicago	33.00	33.00	30.00	29.50	25.50
No. 1 Heavy Melt, Valley	35.00	35.00	32.50	34.50	31.25
No. 1 Heavy Melt, Cleve.	32.00	32.00	28.50	31.50	26.50
No. 1 Heavy Melt, Buffalo	30.50	30.50	28.50	33.50	28.25
Rails, Rerolling, Chicago	52.50	51.50	44.50	42.50	41.50
No. 1 Cast, Chicago	39.50	39.50	35.50	32.50	41.50

COKE, Net Ton

Beehive, Furn, Connisvl.	$13.75	$14.75	$14.75	$14.75	$13.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

Daily Nonferrous Price Record

	Price Oct. 13	Last Change	Previous Price	Sept. Avg.	Aug. Avg.	Oct. 1953 Avg.
Copper	30.00	Apr. 12	29.75–30.00	30.000	30.000	29.606
Lead	14.80	Oct. 4	14.55	14.400	13.846	13.300
Zinc	11.50	Sept. 3	11.00	11.000	11.000	10.000
Tin	93.50	Oct. 13	93.625	93.545	93.332	81.096
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.200	22.119	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on; Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, del.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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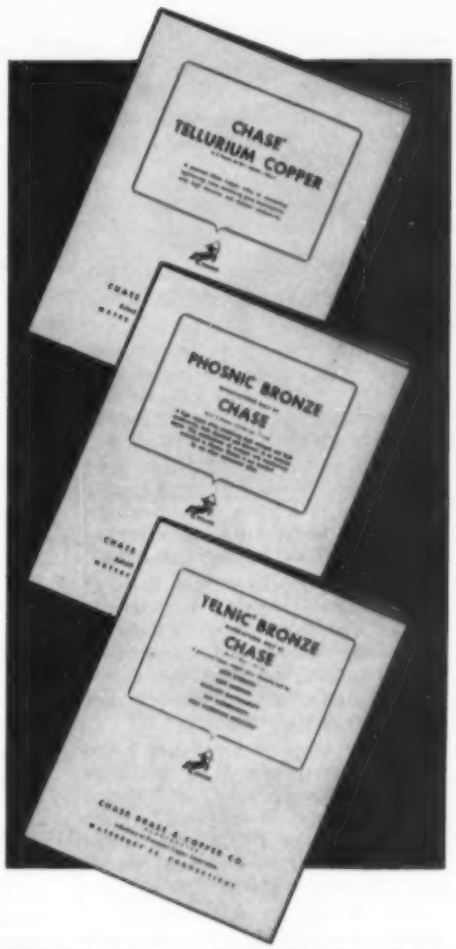

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Nonferrous Metals

Aluminum is winning out over consumer resistance to new materials in construction products field. Sales there are up 20 per cent this year

Nonferrous Metal Prices, Page 142 & 143

ALUMINUM is over the hump of consumer resistance to new materials. That's the consensus of the aluminum building products industry, which has seen sales rise an average of 20 per cent this year, a greater gain percentagewise than construction activity in general.

A nationwide survey by Nichols Wire & Aluminum Co. shows sales of aluminum nails in the third quarter broke all industry records, topping second quarter (traditionally high period of the year for building products) by 35 per cent. October bookings, says Nichols, are also at record levels: "Despite continuation of low inventory policies, indications are that sales will remain strong for the rest of this year."

Turntable—One of the best barometers of sales in the aluminum field is manufacturers wire, a product sold for further processing into a variety of goods. "Manufacturers wire has been on a 60-day delivery basis since July, a sharp change from the early part of the year when manufacturers wire sales were down as much as 25 per cent from previous first-halfs."

Why the rapid growth in sales of aluminum nails, fencing, roofing and siding? Nichols' E. C. Manix believes the public has altered its attitude toward building products from one of "lowest first cost" to "lowest cost for the life of the product."

Military sales of aluminum building products present a big challenge to the industry, says Mr. Manix. With increased dependency on air transportation of supplies, the Armed Forces must be sold on the "simple logistical advantages of light metals."

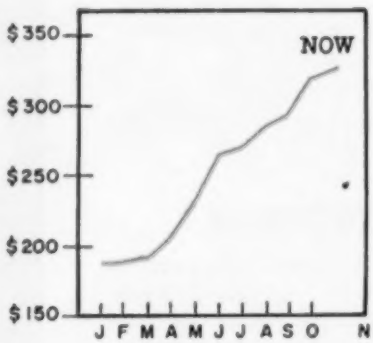
New Siding—Alcoa is wooing the industrial building market with a new low-cost ribbed siding that can be used on frame type structures, such as facing sheet on concrete block buildings and for sandwich wall construction. Ribbed design is achieved by trapezoidal corrugations; embossed finish offers a light-diffusing effect.

Busy Month for Aluminum

Briskness of aluminum sales is indicated by Aluminum Association statistics on product shipments. In August, foil shipments topped 7000 tons, an all-time monthly high. Foil and wire (other than conductor) shipments in August topped July and August, 1953, while forgings, drawn tube and extruded products were below both the previous month and year-ago levels. Sheet and plate, rod and bar, and all types of castings were higher in August than in July but below August, 1953. Only ACSR and bare cable shipments were above the year-ago figures but below those of a month ago.

Mercury— Where's the Ceiling?

(price, 76-lb flask, New York, for spot delivery)



Kaiser Broadens Range

Kaiser Aluminum & Chemical Corp. is widening its range of aluminum mill products by leasing the government-owned forging plant at Erie, Pa., formerly operated by Willys Motors Inc. The eleventh major installation in the company's integrated operation, the plant has rated annual capacity close to 15 million lb. Kaiser's lease covers a period up to 20 years. The company's midwest investment is growing rapidly. In addition to its rod, bar, wire and electrical conductor plant at Newark, O. (which will supply forging stock for the Erie operation), the company is building a huge sheet and foil rolling mill near Ravenswood, W. Va.

Headache for Copper Users

Copper users' worries are just beginning, though mine strike flareups are flickering and dying. Close to 70,000 tons of copper has been lost to the market in recent shutdowns. Renewal of operations at Anaconda's Montana properties (at an estimated 10-cent package increase) and seven-day weeks at a number of mines will fill the pipelines gradually. But that's not soon enough for fabricators. National Electrical Manufacturers Association requested the government to defer stockpile shipments of copper for several months and embargo copper scrap exports to ease their squeeze.

Indications of the tight supply: Dealer sales at up to 39 cents a pound are reported, and toll contracts are back. In the latter, custom smelters process metal for a customer on a conversion basis, which allows paying top prices for scrap. Refined metal brings up to 33 cents a pound for 60 to 90-day delivery under these deals. Producer and custom smelter prices are still maintained at 30 cents a pound.

Strike Cuts Zinc Supply

In addition to the monthly hypo of stockpile buying, zinc markets have been helped statistically by a 6-week production loss at Anaconda's strikebound Montana properties. Stocks going into October slipped 18,000 tons to 175,482 tons, lowest since last November. September output of 60,092 tons was lowest in eight years, while shipments moved to 64,526 tons and unfilled orders rose encouragingly to 48,818 tons. General Services Administration has accepted higher zinc levels, buying from producers at 11.50 cents a pound.

Market Memos

- Refined silver output in the first eight months was up 8 per cent from the similar period of last year to 51,745,000 ounces.

- Remelt aluminum ingots are wending their way to higher price levels, with another quarter-cent increase coming last week. Scrap buying prices are unchanged.

- Magnesium products shipments in August hit 555.5 tons, an 8 per cent gain from July.

- Bristol Brass Corp., Bristol, Conn., producer of strip, rod, wire and extruded shapes, bought up Accurate Brass Co., Glendale, N. Y., producer of brass and aluminum forgings.

COMING SOON!

COLD-ROLLED SHEETS FROM *Newport Steel*

A reversing cold mill is one more new facility in the continuing expansion program at Newport Steel. Building construction and the mill itself with all supporting equipment already are well along, and early in 1955 cold-rolled sheets will be added to an already creditable list of Newport products. Sixty-nine years' experience, modern facilities, central location, and the irrevocable policy of giving customers an abundance of both quality and service—all make Newport a most dependable source for your steel requirements. Let us tell you more about our ability to serve you now and in the future.

ECONOMICAL WATERAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South.

PRODUCTS OF NEWPORT STEEL

- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Electric Weld Line Pipe
- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

Newport Steel CORPORATION

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Metals
Nonferrous

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $320-$325-$330, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 93.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.72; grade A-2 (0.5% Fe max) $4.46 per pound

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb, f.o.b. shipping point; less than 1000 lb $5.10 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 16.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 21.25-21.75; No. 12 foundry alloy (No. 2 grade) 20.25-20.75; 5% silicon alloy, 0.60 Cu max., 23.75-24.00; 13 alloy, 0.60 Cu max., 23.75-24.00; 195 alloy 21.75-22.75; 108 alloy 20.75-21.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 19.50-20.00; grade 4, 18.50-19.00.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.25; manganese bronze No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy.) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb. 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes ...	82.5	65.5	88.5
Seamless Tubes.	115.5	100.5	137.5
Shot, Blocks		60.0	....

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	62.5	61.0	...	...
0.130-0.172	52.9	51.3	...	...
0.188	52.9	51.3	...	63.8
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	62.7
0.313	50.1	48.5	...	59.8
Cold-finished				
0.375-0.547	48.9	46.5	58.8	56.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.6
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.6
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.60

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in., 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 14.00; low copper clippings 14.00; mixed clippings 12.00; old sheet 11.00; borings and turnings 7.00; pistons and struts 8.50; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90% ...	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5% ...	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire, No. 1 25.75-26.25; No. 2 copper 24.25-24.75; light copper 22.25-22.75; No. 1 composition red brass 19.50; No. 1 composition turnings 19.00; mixed brass turnings 12.50; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.00; heavy yellow brass 15.00; new brass rod ends 16.00; auto radiators, unsweated 16.00; cocks and faucets 16.50; brass pipe 17.00.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 16.00-16.25; 51S, 52S clippings 16.00-16.25; 14S, 17S, 24S clippings 15.25-15.50; mixed clipping 14.75-15.00; old sheet 14.00-14.25; old cast 14.00-14.25; clean old cable, free of steel 16.00-16.25; borings and turnings 14.25-14.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 28.50 nom.; No. 2 copper 27.00 nom.; light copper 25.50 nom.; refinery brass (60% copper) per dry copper content 25.00-25.50 nom.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 28.50 nom.; No. 2 copper 27.00 nom.; light copper 25.50 nom.; No. 1 composition borings 22.50-22.75; No. 1 composition solids 23.00-23.25; heavy yellow brass solids 18.00-18.25; yellow brass turnings 17.00-17.25; radiators 19.00-19.25.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.115; 200-499 lb $1.10; 500-999 lb $1.095; 1000 lb or more $1.09.

Zinc: Bar 18.50, bar or flat top 17.50 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb. in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71; 100-600 lb 56.7; 700-1900 lb 54.3; 2000-9900 lb 52.5; 10,000 lb or more 51.4.

Stannous Chloride: (Anhydrous): Less than 50 lb $1.57; 50 lb $1.23; 100-300 lb $1.08; 400-900 lb $1.055; 100-1900 lb $1.031; 2000-4900 lb 99.4; 5000-19,000 lb 99.3; 20,000 lb and over 87.2.

Stannous Sulphate: Less than 5 lb $1.269; 50 lb 96.9; 100-1900 lb 94.9; 2000 lb and over 92.9.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

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In frontier days, the backwoodsman called upon the most skilled blacksmith available to fashion a bowie knife of great strength, for often the backwoodsman's very life depended upon the quality of its blade. Today, when forgings are subjected to tremendous stresses, it is equally important that they be produced by trained specialists, combining expert skill with pride of workmanship, to make sure they will stand up to the rigid requirements of the jobs they are designed to do.

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Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 145. Key to footnotes, page 147.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$61.50

INGOTS, Alloy (NT)

Detroit R7	$65.00
Houston S5	73.00
Midland,Pa. C18	65.00
Munhall,Pa. U5	65.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Aliquippa,Pa. J5	$64.00
Bessemer,Pa. U5	64.00
Buffalo R2	64.00
Clairton,Pa. U5	64.00
Ensley,Ala. T2	64.00
Fairfield,Ala. T2	64.00
Fontana,Calif. K1	72.00
Gary,Ind. U5	64.00
Johnstown,Pa. B2	64.00
Lackawanna,N.Y. B2	64.00
Munhall,Pa. U5	64.00
So.Chicago,Ill. R2,U5	64.00
So.Duquesne,Pa. U5	64.00
Youngstown R2	64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$78.00
Bessemer,Pa. U5	78.00
Buffalo R2	78.00
Canton,O. R2	80.00
Clairton,Pa. U5	78.00
Conshohocken,Pa. A3	83.00
Ensley,Ala. T2	78.00
Fairfield,Ala. T2	78.00
Fontana,Calif. K1	86.00
Gary,Ind. U5	78.00
Geneva,Utah C11	78.00
Houston S5	85.00
Johnstown,Pa. B2	78.00
Lackawanna,N.Y. B2	78.00
LosAngeles B3	87.50
Munhall,Pa. U5	78.00
Seattle B3	91.50
So.Chicago R2,U5,W14	78.00
So.Duquesne,Pa. U5	78.00
So.SanFrancisco B3	87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$86.00
Buffalo R2	86.00
Canton,O. R2, T7	86.00
Conshohocken,Pa. A3	93.00
Detroit R7	86.00
Fontana,Calif. K1	105.00
Gary,Ind. U5	86.00
Houston S5	93.00
Ind.Harbor,Ind. Y1	86.00
Johnstown,Pa. B2	86.00
Lackawanna,N.Y. B2	86.00
LosAngeles B3	106.00
Massillon,O. R2	86.00
Midland,Pa. C18	86.00
Munhall,Pa. U5	86.00
So.Chicago R2,U5,W14	86.00
So.Duquesne,Pa. U5	86.00
Struthers,O. Y1	86.00
Warren,O. C17	86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$96.50
Canton,O. R2	96.50
Cleveland R2	96.50
Gary,Ind. U5	96.50
So.Chicago R2, W14	96.50
So.Duquesne,Pa. U5	96.50

SKELP

Aliquippa,Pa. J5	4.00
Fontana,Calif. K1	4.775
Munhall,Pa. U5	3.90
Warren,O. R2	3.90
Youngstown R2, U5	3.90

WIRE RODS

AlabamaCity,Ala. R2	4.675
Aliquippa,Pa. J5	4.675
Alton,Ill. L1	4.85
Buffalo B11, W12	4.675
Cleveland A7	4.675
Donora,Pa. A7	4.675
Fairfield,Ala. T2	4.675
Fontana,Calif. K1	5.475
Houston S5	5.075
IndianaHarbor,Ind. Y1	4.675
Johnstown,Pa. B2	4.675
Joliet,Ill. A7	4.675
KansasCity,Mo. S5	5.015
Kokomo,Ind. C18	4.775
LosAngeles B3	5.475
Minnequa,Colo. C10	4.925
Monessen,Pa. P7	4.675
No.Tonawanda,N.Y. B11	4.675
Pittsburg,Calif. C11	5.325
Portsmouth P12	4.675
Roebling,N.J. R5	4.775
So.Chicago,Ill. R2	4.675
Sterling,Ill.(1) N15	4.675
Sterling,Ill. N15	4.775
Struthers,O. Y1	4.675
SparrowsPoint,Md. B2	4.775
Torrance,Calif. C11	5.475
Worcester,Mass. A7	4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2	4.25
Aliquippa,Pa. J5	4.25
Bessemer,Ala. T2	4.25
Bethlehem,Pa. B2	4.30
Birmingham C15	4.25
Clairton,Pa. U5	4.25
Fairfield,Ala. T2	4.25
Fontana,Calif. K1	4.90
Gary,Ind. U5	4.25
Geneva,Utah C11	4.25
Houston S5	4.65
Ind.Harbor,Ind. I-2	4.25
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.30
LosAngeles B3	4.95
Minnequa,Colo. C10	4.70
Munhall,Pa. U5	4.25
Niles,Calif. P1	4.80
Phoenixville,Pa. P4	3.95
Portland,Oreg. O4	5.00
Seattle B3	5.00
So.Chicago U5, W14	4.25
So.SanFrancisco B3	4.90
Torrance,Calif. C11	4.95
Weirton,W.Va. W6	4.25

Wide Flange

Bethlehem,Pa. B2	4.30
Clairton,Pa. U5	4.25
Fontana,Calif. K1	5.25
Lackawanna,N.Y. B2	4.30
Munhall,Pa. U5	4.25
Phoenixville,Pa. P4	3.95
So.Chicago,Ill. U5	4.25

Alloy Stand. Shapes

Clairton,Pa. U5	5.20
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.20
Houston S5	5.60
Munhall,Pa. U5	5.20
So.Chicago,Ill. U5	5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.40
Bessemer,Ala. T2	6.40
Bethlehem,Pa. B2	6.45
Clairton,Pa. U5	6.40
Fairfield,Ala. T2	6.40
Fontana,Calif. K1	7.05
Gary,Ind. U5	6.40
Geneva,Utah C11	6.40
Houston S5	6.80
Ind.Harbor,Ind. I-2, Y1	6.40
Johnstown,Pa. B2	6.45
KansasCity,Mo. S5	7.00
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.10
Munhall,Pa. U5	6.40
Seattle B3	7.15
So.Chicago,Ill. U5, W14	6.40
So.SanFrancisco B3	7.05
Struthers,O. Y1	6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.45
Lackawanna,N.Y. B2	6.45
Munhall,Pa. U5	6.40
So.Chicago,Ill. U5	6.40

PILING

BEARING PILES

Munhall,Pa. U5	4.25
So.Chicago,Ill. U5	4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	5.075
Lackawanna,N.Y. B2	5.075
Munhall,Pa. U5	5.075
So.Chicago,Ill. U5	5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2	4.225
Aliquippa,Pa. J5	4.225
Ashland,Ky.(15) A10	4.225
Bessemer,Ala. T2	4.225
Buffalo R2	4.225
Clairton,Pa. U5	4.225
Claymont,Del. C22	4.225
Cleveland J5, R2	4.225
Coatesville,Pa. L7	4.225
Conshohocken,Pa. A3	4.225
Ecorse,Mich. G5	4.375
Fairfield,Ala. T2	4.225
Fontana,Calif.(30) K1	4.875
Gary,Ind. U5	4.225
Geneva,Utah C11	4.225
GraniteCity,Ill. G4	4.425
Harrisburg,Pa. C5	3.975
Houston S5	4.625
Ind.Harbor,Ind. I-2, Y1	4.225
Johnstown,Pa. B2	4.225
Lackawanna,N.Y. B2	4.225
LoneStar,Tex. L6	4.55
Mansfield,O. E6	4.225
Minnequa,Colo. C10	5.075
Munhall,Pa. U5	4.225
Newport,Ky. N9	4.225
Pittsburgh J5	4.225
Riverdale,Ill. A1	4.225
Seattle B3	5.125
Sharon,Pa. S3	4.225
So.Chicago,Ill. R2	4.225
So.Chicago,Ill. U5,W14	4.225
SparrowsPoint,Md. B2	4.225
Steubenville,O. W10	4.225
Warren,O. R2	4.225
Weirton,W.Va. W6	4.225
Youngstown R2, U5, Y1	4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1	6.025
Geneva,Utah C11	5.375

PLATES, Wrought Iron

Economy,Pa. B14	9.50

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5	5.45
Bessemer,Ala. T2	6.45
Clairton,Pa. U5	6.45
Cleveland J5, R2	6.45
Conshohocken,Pa. A3	6.45
Ecorse,Mich. G5	6.60
Fairfield,Ala. T2	6.45
Fontana,Calif.(30) K1	7.15
Gary,Ind. U5	6.45
Geneva,Utah C11	6.45
Houston S5	6.85
Ind.Harbor,Ind. I-2, Y1	6.45
Johnstown,Pa. B2	6.45
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.35
Munhall,Pa. U5	6.45
Pittsburgh J5	6.45
Seattle B3	7.35
Sharon,Pa. S3	6.45
So.Chicago,Ill. U5, W14	6.45
SparrowsPoint,Md. B2	6.45
Youngstown U5, Y1	6.45

PLATES, Alloy

Claymont,Del. C22	5.80
Coatesville,Pa. L7	5.80
Fontana,Calif. K1	6.45
Gary,Ind. U5	5.80
Houston S5	6.20
Johnstown,Pa. B2	5.80
Munhall,Pa. U5	5.80
Newport,Ky. N9	5.80
Seattle B3	6.70
Sharon,Pa. S3	5.80
So.Chicago,Ill. U5, W14	5.80
SparrowsPoint,Md. B2	5.80

FLOOR PLATES

Cleveland J5	5.275
Conshohocken,Pa. A3	5.275
Harrisburg,Pa. C5	5.15
Ind.Harbor,Ind. I-2	5.275
Munhall,Pa. U5	5.275
So.Chicago,Ill. U5	5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10	4.475
Ashland l.c.l. (15) A10	4.975
Cleveland c.l. R2	4.825
Warren,O. c.l. R2	4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2	4.30
Aliquippa,Pa. J5	4.30
Alton,Ill. L1	4.50
Atlanta,Ga. A11	4.50
Bessemer,Ala. T2	4.30
Birmingham C15	4.30
Buffalo R2	4.30
Canton,O. R2	4.40
Clairton,Pa. U5	4.30
Cleveland R2	4.30
Ecorse,Mich. G5	4.45
Emeryville,Calif. J7	5.05
Fairfield,Ala. T2	4.30
Fairless,Pa. U5	4.45
Fontana,Calif. K1	5.00
Gary,Ind. U5	4.30
Houston S5	4.70
Ind.Harbor,Ind. I-2, Y1	4.30
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.90
Lackawanna,N.Y. B2	4.30
LosAngeles B3	5.00
Massillon,O. R2	4.40
Milton,Pa. M18	4.30
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
N.Tonawanda,N.Y. B11	4.30
Pittsburg,Calif. C11	5.00
Pittsburgh J5	4.30
Portland,Oreg. O4	5.05
Seattle B3, N14, P23	5.05
So.Chicago, R2 U5, W14	4.30
So.Duquesne,Pa. U5	4.30
So.SanFran.,Calif. B3	5.05
Sterling,Ill.(1) N15	4.30
Sterling,Ill. N15	4.40
Struthers,O. Y1	4.30
Torrance,Calif. C11	5.00
Warren,O. R2	4.30
Weirton,W.Va. W6	4.30
Youngstown R2, U5	4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	5.075
Buffalo R2	5.075
Canton,O. R2, T7	5.075
Clairton,Pa. U5	5.075
Detroit R7	5.075
Ecorse,Mich. G5	5.225
Fontana,Calif. K1	6.125
Fairless,Pa. U5	5.225
Gary,Ind. U5	5.075
Houston S5	5.475
Ind.Harbor,Ind. I-2, Y1	5.075
Johnstown,Pa. B2	5.075
KansasCity,Mo. S5	5.675
Lackawanna,N.Y. B2	5.075
LosAngeles B3	6.125
Massillon,O. R2	5.075
Midland,Pa. C18	5.075
So.Chicago R2, U5, W14	5.075
So.Duquesne,Pa. U5	5.075
Struthers,O. Y1	5.075
Warren,O. C17	5.075
Youngstown U5	5.075

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.45
Bessemer,Ala. T2	6.45
Bethlehem,Pa. B2	6.45
Clairton,Pa. U5	6.45
Cleveland R2	6.45
Ecorse,Mich. G5	6.60
Fairfield,Ala. T2	6.45
Fontana,Calif. K1	7.70
Gary,Ind. U5	6.45
Houston S5	6.85
Ind.Harb.,Ind. I-2, Y1	6.45
Johnstown,Pa. B2	6.45
KansasCity,Mo. S5	7.05
Lackawanna,N.Y. B2	6.45
LosAngeles B3	7.15
Pittsburgh J5	6.45
Seattle B3	7.20
So.Chicago W14	6.45
So.Duquesne,Pa. U5	6.45
So.SanFrancisco B3	7.20
Struthers,O. Y1	6.45
Warren,O. R2	6.45
Youngstown U5	6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2	4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	4.30
Atlanta A11	4.50
Fontana,Calif. K1	5.00
Niles,Calif. P1	4.85
Portland,Oreg. O4	5.05
SanFrancisco S7	4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.20
Gary,Ind. U5	5.20
Houston S5	5.60
KansasCity S5	5.80
Youngstown U5	5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.40
BeaverFalls,Pa. M12, R2	5.40
Camden,N.J. P13	5.85
Carnegie,Pa. C12	5.40
Chicago W18	5.40
Cleveland A7, C20	5.40
Detroit R7	5.40
Detroit B5, P17	5.60
Donora,Pa. A7	5.40
Elyria,O. W8	5.40
FranklinPark,Ill. N5	5.40
Gary,Ind. R2	5.40
GreenBay,Wis. P7	5.40
Hammond,Ind. L2, M13	5.40
Hartford,Conn. R2	5.90
Harvey,Ill. B5	5.40
LosAngeles R2, S30	6.85
Mansfield,Mass. B5	5.95
Massillon,O. R2 R8	5.40
Monaca,Pa. S17	5.40
Newark,N.J. W18	5.85
NewCastle,Pa.(17) B4	5.40
Pittsburgh J5	5.40
Plymouth,Mich. P5	5.65
Putnam,Conn. W18	5.95
Readville,Mass. C14	5.95
St.Louis,Mo. M5	5.70
So.Chicago,Ill. W14	5.40
SpringCity,Pa. K3	5.85
Struthers,O. Y1	5.40
Waukegan,Ill. A7	5.40
Worcester,Mass. W19	5.85
Youngstown F3, Y1	5.40

BARS, Cold-Finished Alloy (Turned and Ground)

Cumberland,Md.(5) C19	4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.625
BeaverFalls,Pa. M12, R2	6.625
Bethlehem,Pa. B2	6.625
Buffalo B5	6.625
Camden,N.J. P13	6.80
Canton,O. T7	6.625
Carnegie,Pa. C12	6.625
Chicago W18	6.625
Cleveland A7, C20	6.625
Detroit R7	6.625
Detroit B5, P17	6.825
Donora,Pa. A7	6.625
Elyria,O. W8	6.625
Gary,Ind. R2	6.625
Hammond,Ind. L2, M13	6.625
Hartford,Conn. R2	6.925
Harvey,Ill. B5	6.625
Lackawanna,N.Y. B2	6.625
LosAngeles S30	8.30
Mansfield,Mass. B5	6.925
Massillon,O. R2, R8	6.625
Midland,Pa. C18	6.625
Monaca,Pa. S17	6.625
Newark,N.J. W18	6.80
Plymouth,Mich. P5	6.825
So.Chicago W14	6.625
SpringCity,Pa. K3	6.80
Struthers,O. Y1	6.625
Warren,O. C17	6.625
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925
Youngstown F3, Y1	6.625

BARS, Reinforcing (Fabricators)

Ala.City,Ala. R2	4.30
Atlanta A11	4.50
Birmingham C15	4.30
Buffalo R2	4.30
Cleveland R2	4.30
Emeryville,Calif. J7	5.05
Fairfield,Ala. T2	4.30
Fairless,Pa. U5	4.45
Fontana,Calif. K1	5.00
Ft.Worth,Tex.(42) T4	4.90
Gary,Ind. U5	4.30
Houston S5	4.70

Ind.Harbor,Ind. I-2, Y1 4.30
Johnstown,Pa. B2 ..... 4.30
KansasCity,Mo. S5 .... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ..... 5.00
Milton,Pa. M18 ..... 4.30
Minnequa,Colo. C10 .... 4.75
Niles,Calif. P1 ..... 4.85
Pittsburg,Calif. C11 .... 5.00
Pittsburgh J5 ..... 4.30
Portland,Oreg. O4 ..... 5.05
SandSprings,Okla. S5 .. 5.15
Seattle B3, N14, P23 .. 5.05
So.Chicago R2 ..... 4.30
So.Duquesne,Pa. U5 ... 4.30
So.SanFrancisco B3 .... 5.05
SparrowsPoint,Md. B2 .. 4.30
Sterling,Ill.(1) N15 .... 4.30
Sterling,Ill. N15 ..... 4.40
Struthers,O. Y1 ..... 4.30
Torrance,Calif. C11 .... 5.00
Youngstown R2, U5 .... 4.30

BARS, Reinforcing (Fabricated; to consumers)

Johnstown,Pa., ¼-1" B2 5.70
KansasCity S5 ..... 6.50
LosAngeles B3 ..... 5.95
Marion,O. P11 ..... 5.55
Seattle B3, N14, P23 .. 6.15
So.SanFrancisco B3 .... 6.00
SparrowsPt. ¼-1" B2.. 5.70
Williamsport,Pa. S19 .. 5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 ..... 4.25
ChicagoHts.(3) C2, I-2 4.20
ChicagoHts.(4) C2, I-2 4.30
Ft.Worth,Tex(26) T4 .. 4.75
Franklin,Pa. (3) F5 .... 4.20
Franklin,Pa. (4) F5 .... 4.30
Marion,O.(3) P11 ..... 4.15
Moline,Ill.(3) R2 ..... 4.30
Tonawanda(3) B12 .... 4.15
Tonawanda(4) B12 .... 4.30
Williamsport,Pa.(3) S19 4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.39
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 ..10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)

Ala.City,Ala. R2 ..... 4.05
Allenport,Pa. P7 ..... 4.05
Ashland,Ky.(8) A10 .... 4.05
Cleveland J5, R2 ..... 4.05
Conshohocken,Pa. A3 .. 4.10
Detroit(8) M1 ..... 4.20
Ecorse,Mich. G5 ..... 4.20
Fairfield,Ala. T2 ..... 4.05
Fairless,Pa. U5 ..... 4.10
Fontana,Calif. K1 .... 4.825
Gary,Ind. U5 ..... 4.05
Geneva,Utah C11 ..... 4.15
GraniteCity,Ill. G4 .... 4.25
Houston S5 ..... 4.45
Ind.Harbor,Ind. I-2, Y1 4.05
Irvin,Pa. U5 ..... 4.05
Kokomo,Ind. C16 ..... 4.15
Lackawanna,N.Y. B2 .... 4.05
Mansfield,O. E6 (37) 4.05
Mansfield,O. E6 (38) 4.80
Munhall,Pa. U5 ..... 4.05
Newport,Ky. N9 ..... 4.05
Niles,O. N12 ..... 4.05
Pittsburg,Calif. C11 .... 4.75
Pittsburgh J5 ..... 4.05
Portsmouth,O. P12 ..... 4.05
Riverdale,Ill. A1 ..... 4.05
Sharon,Pa. S3 ..... 4.05
So.Chicago,Ill. W14 .... 4.05
SparrowsPoint,Md. B2 .. 4.05
Steubenville,O. W10 .... 4.05
Warren,O. R2 ..... 4.05
Weirton,W.Va. W6 .... 4.05
Youngstown U5, Y1 .... 4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2 ..... 5.35
Kokomo,Ind. C16 ..... 5.20
Niles,O. N12 ..... 4.95

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 ..... 6.10
Conshohocken,Pa. A3 .. 6.15
Ecorse,Mich. G5 ..... 6.25
Fairfield,Ala. T2 ..... 6.10
Fairless,Pa. U5 ..... 6.15
Fontana,Calif. K1 .... 6.875
Gary,Ind. U5 ..... 6.10
Ind.Harbor,Ind. I-2, Y1 6.10
Irvin,Pa. U5 ..... 6.10
Lackawanna(35) B2 .... 6.10
Munhall,Pa. U5 ..... 6.10
Pittsburgh J5 ..... 6.10
Sharon,Pa. S3 ..... 6.10
So.Chicago,Ill. U5 .... 6.10
SparrowsPoint(36) B2 .. 6.10
Warren,O. R2 ..... 6.10
Weirton,W.Va. W6 .... 6.10
Youngstown U5, Y1 .... 6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 .... 4.30
Cleveland R2 ..... 4.65
Ind.Harbor,Ind. I-2 .... 4.30
Warren,O. R2 ..... 4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ..... 4.95
Cleveland J5, R2 ..... 4.95
Ecorse,Mich. G5 ..... 5.10
Fairfield,Ala. T2 ..... 4.95
Fairless,Pa. U5 ..... 5.00
Follansbee,W.Va. F4 .... 4.95
Fontana,Calif. K1 ..... 6.05
Gary,Ind. U5 ..... 4.95
GraniteCity,Ill. G4 ..... 5.15
Ind.Harbor,Ind. I-2, Y1 4.95
Irvin,Pa. U5 ..... 4.95
Lackawanna,N.Y. B2 .... 4.95
Middletown,O. A10 .... 4.95
Pittsburg,Calif. C11 .... 5.90
Pittsburgh J5 ..... 4.95
Portsmouth,O. P12 ..... 4.95
SparrowsPoint,Md. B2 .. 4.95
Steubenville,O. W10 .... 4.95
Warren,O. R2 ..... 4.95
Weirton,W.Va. W6 .... 4.95
Youngstown Y1 ..... 4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .... 7.50
Ecorse,Mich. G5 ..... 7.65
Fairless,Pa. U5 ..... 7.55
Fontana,Calif. K1 .... 8.55
Gary,Ind. U5 ..... 7.50
IndianaHarbor,Ind. Y1.. 7.50
Irvin,Pa. U5 ..... 7.50
Lackawanna(37) B2 .... 7.50
Pittsburgh J5 ..... 7.50
SparrowsPoint(38) B2 .. 7.50
Warren,O. R2 ..... 7.50
Weirton,W.Va. W6 .... 7.50
Youngstown Y1 ..... 7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 ..... 5.55
Middletown,O. A10 .... 5.45
Warren,O. R2 ..... 5.55

SHEETS, Culvert (16 Ga.)	Cu Alloy	Cu Fe
Ashland,Ky.	A10 6.50	....
Canton,O.	R2 ... 6.50	7.10
Fairfield	T2 ..... 5.70	....
Gary,Ind.	U5 .... 5.70	5.95
Ind.Harbor	I-2 .. 6.25	6.50
Irvin, Pa.	U5 .. 5.70	....
Kokomo,Ind.	C16 6.35	....
MartinsFry.,O.	W10 6.25	....
Newport,Ky.	N9.. 6.25	6.50
Pitts.,Calif.	C11 .6.45	....
SparrowsPt.	B2.. 6.25	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.75
MartinsFerry,O. W10	6.50
Gary,Ind. U5	5.95

SHEETS, Galvanized Steel Hot-dipped

Ala.City,Ala. R2 ..... 5.45‡
Ashland,Ky. A10 ..... 5.45*
Butler,Pa. A10 ..... 5.45†
Canton,O. R2 ..... 5.45‡
Dover,O. R1 ..... 5.45‡
Fairfield,Ala. T2 ..... 5.45*
Gary,Ind. U5 ..... 5.45*
GraniteCity,Ill. G4 .... 5.65‡
Ind.Harbor,Ind. I-2 ... 5.45†
Irvin,Pa. U5 ..... 5.45†
Kokomo,Ind. C16 ..... 5.55‡
MartinsFerry,O. W10 .. 5.45*
Middletown,O. A10 .... 5.45†
Newport,Ky. N9 ..... 5.45†
Niles,O. N12 ..... 5.45‡
Pittsburg,Calif. C11 .. 6.20‡
SparrowsPt.,Md. B2 .. 5.45‡
Steubenville,O. W10 ... 5.45‡
Weirton,W.Va. W6 .... 5.45*

*Continuous and noncontinuous. †Continuous. ‡ Noncontinuous.

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5 ..... 8.20
SparrowsPoint(39) B2 .. 8.20

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.85
Irvin,Pa. U5 ..... 5.85
Kokomo,Ind. C16 ..... 5.95†
Newport,Ky. N9 ..... 6.00
Niles,O. N12 ..... 6.00

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 .... 5.70
Canton,O. R2 ..... 6.20

SHEETS, Galvanized Ingot Iron (Hot-dipped continuous)

Ashland,Ky. A10 ..... 5.70
Butler,Pa. A10 ..... 5.70
Middletown,O. A10 .... 5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 ..... 6.30
Niles,O.(28) R2 ..... 6.30
Weirton,W.Va. W6 .... 5.975

SHEETS, Aluminum Coated

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 .... 5.375
Cleveland R2 ..... 5.375
Gary,Ind. U5 ..... 5.375
GraniteCity,Ill. G4 .... 5.575
Ind.Harbor,Ind. I-2 .... 5.375
Irvin,Pa. U5 ..... 5.375
Middletown,O. A10 .... 5.375
Niles,O. N12 ..... 5.375
Youngstown Y1 ..... 5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 .. 7.375
Follansbee(23) F4 ..... 6.60
Yorkville,O. W10 ..... 7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 ..... 5.85
Mansfield,O. E6 ..... 5.85
Middletown,O. A10 .... 5.85
Niles,O. N12 ..... 5.85
Weirton,W.Va. W6 .... 5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .... 6.25

SHEETS, Well Casing

Fontana,Calif. K1 .... 6.325

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T3 Tenn. Coal & Iron Div.
T3 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan.San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R3	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn.(10)S15	4.05
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	*4.10*
Detroit M1	4.20
Ecorse,Mich. G5	4.20
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Houston,Tex. S5	4.45
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
KansasCity,Mo.(9) S5	4.45
Lackw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.95
Minnequa,Colo. C10	5.15
NewBritain(10) S15	4.05
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S8	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15	6.45
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Houston,Tex. S5	7.10
KansasCity,Mo. S5	7.30
LosAngeles B3	7.90
NewBritn.,Conn.(10)S15	6.45
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.55
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.75
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Bridgeport,Conn.(10)S15	5.75
Cleveland A7, J5	5.75
Dearborn,Mich. D3	5.90
Detroit D2, M1	5.90
Detroit P20	5.95
Dover,O. G6	5.75
Ecorse,Mich. G5	5.90
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	6.00
Indianapolis C8	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Mattapan,Mass. T6	6.30
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt., Md. B2	5.75
Trenton,N.J. R5	7.00
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Mattapan,Mass. T6	12.80
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.75
Dover,O. G6	8.60
Ecorse,Mich. G5	8.75
Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	8.425
Warren,O. R2	8.60
Weirton,W.Va. W6	8.60
Youngstown Y1	8.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	6.35

STRIP, Electrogalvanized

Dover,O. G6	5.75
Youngstown C8	5.75

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.626
Sharon,Pa. S3	4.475
Youngstown U5	4.475

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.30	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	....	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	....	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.30	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	....	....	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.25	9.30	11.25	....
NewYork W3	....	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	....	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	10.95	13.25
Weirton,W.Va. W6	6.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	....	....	12.90	....	....
Harrison,N.J. C18	....	....	12.90	15.60	19.00
NewYork W3	....	....	12.90	15.60	19.00
Trenton,N.J. R5	....	....	12.90	15.60	19.00
Worcester,Mass. T6	....	....	12.90	15.60	19.00
Worcester,Mass. W12	....	....	12.90	....	....
Youngstown C8	....	....	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.10	11.60
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
IndianaHarbor,Ind. I-2	8.025	8.50	9.10	10.10	....
Mansfield,O. E8	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*‡	8.95*	9.65*‡	10.65*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	....	9.25†‡	9.85†‡	10.85†‡	11.75†‡
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†‡	9.35	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. § Coils. ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	....	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
Fairless,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.15
Jacksonville,Fla. M8	6.27
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.35
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Millbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFran. C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. D2	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7	9.35
Monessen,Pa. P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.35
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	6.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton, Ill. L1	12.75
Bartonville, Ill. K4	13.25
Monessen, Pa. P16	13.15
Portsmouth, O. P12	13.15
Roebling, N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville, Ind. M8	8.05
Dover, O. G6	7.95
Fostoria, O. S1	7.95
Kokomo, Ind. C16	8.05
FranklinPark, Ill. T6	8.05
Massillon, O. R8	7.95
Milwaukee C22	8.15
Monessen, Pa. P7, P16	7.95
Pawtucket, R.I. N8	8.25
Rome, N.Y. (32) R6	7.55
Trenton, N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'd Galv.
Ala. City, Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‡
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90
Crawfordsville M8	7.00 7.55
Donora, Pa. A7	6.90 7.30†
Duluth, Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston, Tex. S5	7.30 7.70†
Jacksonville, Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet, Ill. A7	6.90 7.30†
KansasCity, Mo. S5	7.50 7.90†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts., Calif. C11	7.85 8.25†
Portsmouth, O. P12	6.90
Rankin A7	6.90 7.30†
So. Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
Spar'rwsPt. B2(48)	7.00 7.55*
Str'g(1)(48) N15	6.90 7.45
Struthers, O. (48) Y1	6.90 7.40‡
Worcester A7	7.20

* Based on 11c zinc; †5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.

	Col.
Ala. City, Ala. R2	146**
Ala. City, 17 ga. R2	241**
Ala. City, 18 ga. R2	251**
Aliq'ppa, Pa. 9-14½ ga. J5	149‡
Atlanta A11	151
Bartonville, Ill. K4	151
Crawfordsville, Ind. M8	151
Donora, Pa. A7	146†
Duluth, Minn. A7	146†
Fairfield, Ala. T2	146†
Houston, Tex. S5	154†
Johnstown, Pa. (43) B2	149
Joliet, Ill. A7	146†
KansasCity, Mo. S5	158†
Kokomo, Ind. C16	148†
Minnequa, Colo. C10	154**
Monessen, Pa. 9 ga. P17	151
Pittsburg, Calif. C11	169†
Rankin, Pa. A7	146†
So. Chicago, Ill. R2	146**
Sterling, Ill. (1) N15	149

† Based on 5c zinc; * 11c zinc; ‡ 10c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single loop

	Col.
AlabamaCity, Ala. R2	155
Atlanta A11	157
Bartonville, Ill. K4	157
Crawfordsville, Ind. M8	157
Donora, Pa. A7	155
Duluth, Minn. A7	155
Fairfield, Ala. T2	155
Joliet, Ill. A7	155
Houston S5	163
KansasCity, Mo. S5	167
Kokomo, Ind. C16	157
Minnequa, Colo. C10	160
Pittsburg, Calif. C11	179
So. Chicago, Ill. R2	155
So. SanFran., Calif. C10	179
SparrowsPoint, Md. B2	157
Sterling, Ill (1) N15	155

WIRE, Barbed

	Col.
Alabama, City, Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville, Ill. K4	164
Crawfordsville, Ind. M8	164
Donora, Pa. A7	159†
Duluth, Minn. A7	159†
Fairfield, Ala. T2	159†
Houston, Tex. S5	167†
Johnstown, Pa. B2	162*
Joliet, Ill. A7	159†
KansasCity, Mo. S5	171†
Kokomo, Ind. C16	161†
Minnequa, Colo. C10	165**
Monessen, Pa. P7	163
Pittsburg, Calif. C11	179†
Rankin, Pa. A7	159†
So. Chicago, Ill. R2	159**
S. SanFrancisco C10	179**
SparrowsPoint, Md. B2	164*
Sterling, Ill. (1) N15	162

› Based on 5c zinc; * 11c zinc; §10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'd Galv. Stone	Stone
Ala. City R2	13.15	14.70**
Aliquippa J5	12.50	14.30‡
Bartonville K4	13.25	15.10
Buffalo W12	13.15	
Cleveland A7	13.15	
CrawfordsvilleM8	13.25	15.10
Fostoria, O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	12.60	14.15†
Minnequa C10	13.40	15.10**
Palmer, Mas. W12	13.15	14.70*
Pitts., Calif. C11	13.50	15.05†
So. Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	

* Based on 11c zinc; † 5c zinc; § 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock
To dealers & mfrs. (7)

	Col.
AlabamaCity, Ala. R2	137
Aliquippa, Pa. J5	137
Atlanta A11	139
Bartonville, Ill. K4	139
Chicago, Ill. W13	137
Cleveland A9	142
Crawfordsville, Ind. M8	139
Donora, Pa. A7	137
Duluth, Minn. A7	137
Fairfield, Ala. T2	137
Galveston, Tex. D7	139
Houston, Tex. S5	145
Johnstown, Pa. B2	137
Joliet, Ill. A7	137
KansasCity, Mo. S5	149
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	156
Rankin, Pa. A7	137
So. Chicago, Ill. R2	137
SparrowsPt., Md. B2	139
Sterling, Ill. (1) N15	137
Worcester, Mass. A7	143

NAILS, CUT (100 lb keg)
To dealers (33)

Conshohocken, Pa. A3	$8.30
Wheeling, W.Va. W10	8.30

STAPLES, Polished Stock
To dealers & mfrs. (7)

	Col.
Aliquippa, Pa. J5	138
Atlanta A11	140
Bartonville, Ill K4	140
Crawfordsville, Ind. M8	140
Donora, Pa. A7	138
Duluth, Minn. A7	138
Fairfield, Ala. T2	138
Johnstown, Pa. B2	138
Joliet, Ill. A7	138
Kokomo, Ind. C16	140
Minnequa, Colo. C10	143
Monessen, Pa. P7	138
Pittsburg, Calif. C11	157
Rankin, Pa. A7	138
SparrowsPt. Md. B2	140
Sterling, Ill. (1) N15	138
Worcester, Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts., Ill. C2, I-2	150
Duluth, Minn. A7	150
Franklin, Pa. F5	150
Johnstown, Pa. B2	*150*
Marion, O. P11	*150*
Minnequa, Colo. C10	155
Moline, Ill. R2	155
So. Chicago, Ill. R2	150
Tonawanda, N.Y. B12	150
Williamsport, Pa. S19	150

BOLT, NUTS

CARRIAGE, MACHINE BOLTS
(Base discounts, per cent off list, f.o.b. midwestern plants).

4 in. and shorter:	
½-in. & smaller diam.	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅝" and smaller	55
⅞" to 1¼", inclusive	56
1⅜" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅞" to 1⅛", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS
(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish	67.5—10
Plated finishes	30—10

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:	
½-in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
½-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.35
⅞-in. under..List less 37½

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.26	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Toe Rails All No. 2	Std. Toe Rails 60 lb Under
Bessemer, Pa. U5	4.45	4.35	4.40	5.35
Ensley, Ala. T2	4.45	4.35	....	5.35
Fairfield, Ala. T2	....	....	....	5.35
Gary, Ind. U5	4.45	4.35	4.40	....
Huntington, W.Va. W7	....	....	....	5.35
IndianaHarbor, Ind. I-2	4.45	4.35	4.40	....
Johnstown, Pa. B2	....	....	....(16)	5.35
Lackawanna, N.Y. B2	4.45	4.35	....	5.35
Minnequa, Colo. C10	4.45	4.35	....	5.35
Steelton, Pa. B2	4.45	4.35	....	5.35
Williamsport, Pa. S19	....	....	....	5.35

TIE PLATES

Fairfield, Ala. T2	5.275
Gary, Ind. U5	5.275
Ind. Harbor, Ind. I-2	5.275
Lackawanna, N.Y. B2	5.275
Minnequa, Colo. C10	5.275
Seattle B3	5.425
Steelton, Pa. B2	5.275
Torrance, Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity, Mo. S5	11.50
Lebanon, Pa. B2	11.50
Minnequa, Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle, Wash. B3	12.00

AXLES

Ind. Harbor, Ind. S13	6.75
Johnstown, Pa. B2	6.75

JOINT BARS

Bessemer, Pa. U5	5.425
Fairfield, Ala. T2	5.425
Ind. Harbor, Ind. I-2	5.425
Joliet, Ill. U5	5.425
Lackawanna, N.Y. B2	5.425
Minnequa, Colo. C10	5.425
Steelton, Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield, Ala. T2	7.30
Ind. Harbor, Ind. I-2, Y1	7.30
KansasCity, Mo. S5	7.30
Lebanon, Pa. B2	7.30
Minnequa, Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So. Chicago, Ill. R2	7.30
Struthers, O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron: 98 + % Fe, annealed	Cents 16.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	22.00
Annealed, 99.5% Fe.	36.50
Unannealed (99 + % Fe)	32.50
Unannealed (99 + % Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum: Atomized, 500 lb drums, frgt. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	29.75-37.75†
Bronze, ¼-ton lots	31.00-39.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.25‡
Nickel-Silver, ¼-ton lots	47.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots	17.25-31.00†
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium electrolytic 99.2% Cr min.	3.89

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 29% Zn, 10% Ni; **84% Cu, 16% Zn, 13% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.85c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" widn.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.25c H.S.L.A.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5 (*)	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F8	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	13.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.00	41.25	39.50	42.50	45.00	48.75	48.75
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	42.75	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	46.75	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.50	54.50	53.25	55.50	58.75	62.75	62.75
316L	....	....	51.75	59.75	58.25	60.75	64.00	67.75	67.75
317	33.00	43.50	57.25	66.75	67.50	68.25	70.75	77.00	77.00
318	38.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	45.75	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
348	....	....	48.25	....	....	57.50	62.25	70.50	70.50
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	18.75	24.50	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base		Sheets, Carbon Base
Stainless:			
302	....	31.00	31.00
304	27.60–28.10	32.50–33.20	32.50
310	36.50	41.00	....
316	32.60–33.10	37.70–42.75	42.75
318	37.00–37.50	42.20–42.70	....
321	29.36–29.80	34.40–37.00	37.00
347	30.40–30.90	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.00–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	46.90	61.90	....
Nickel	38.30	51.70	....
Monel	39.70	52.66	....
Copper*	....	....	46.00

	Strip, Carbon Base: Cold-Rolled, 10%	Cold-Rolled, Both Sides	Hot-Rolled, 10%	Hot-Rolled, Both Sides
Copper*	28.85	35.85	25.00	32.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.465	Hi-Carbon-Cr	0.73

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9 C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	52.38	52.88	....	....
Birmingham U5	....	52.88	56.50†	....
Gadsden, Ala. R2	52.38	52.88	....	....
Woodward, Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	*60.53*	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	57.50
Buffalo H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	57.50
Boston, del.	66.65	67.15	67.65	....
Rochester, N.Y., del.	59.02	59.52	60.02	....
Syracuse, N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	....	62.50	62.50	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
New York, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Chester, Pa. C31	....	48.50	49.00	....
Philadelphia, del.	....	50.16	50.66	....
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	....	....	....
Troy, N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, del.	....	57.87	57.87	58.37
McKees Rocks, del.	....	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	58.16	58.16	58.66
Verona, Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	52.00	52.50*	53.50	....
Minnequa, Colo. C10	58.00	59.00	59.00	....
Rockwood, Tenn. T3	....	53.50*	54.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$45.00
Buffalo H1	46.35

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.048% max P)

Niagara Falls, N.Y. P15	$50.50
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	55.00
Keokuk, OH & Fdry, 12½ lb pigs, 16% Si, frgt allowed K2	55.00
Wenatchee, Wash. Off & Fdry, freight allowed K2	55.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, del.	67.55
Troy, N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; New York and Boston, 10 cents; Buffalo, 25 cents on C.R. sheets, galv. sheets, C.F. and alloy bars and 20 cents on other commodities; Philadelphia, 10 cents, except 25 cents on alloy bars; Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††‡		Carbon	Floor
Baltimore	6.02	7.51	7.77	....	6.69	...	6.88	8.52[6]	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[9]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.99
Carnegie, Pa.	6.38	...	8.30	....	6.72	...	6.51	7.85	12.15	6.72	6.65	6.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.84
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.65	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.82
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.25	7.70	9.83	....	7.60	9.30	7.60	9.40	....	7.50	7.25	8.65
Los Angeles	7.40	9.25	9.85	50.15	7.75	11.75	7.35	10.05	13.20	7.55	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	6.81	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[4]	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[9]	6.96	8.80	6.74	8.36[4]	11.96	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.70	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.03	8.03	8.96	....	7.28	...	7.16	8.26	....	7.12	7.19	8.30
San Francisco	7.56	8.95	9.35	48.15	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[2]	10.05	....	7.80	...	7.80	10.85‡‡	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, 11.50-cent zinc) except Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **½-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb; hot-rolled products on West Coast, 2000 to 9999; [2]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

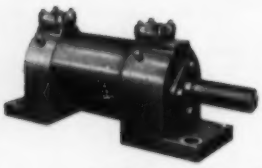
More *modern* Industries

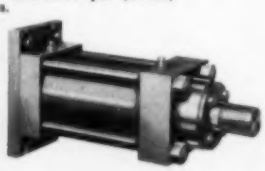
than ever before are now specifying

ACIPCO STEEL

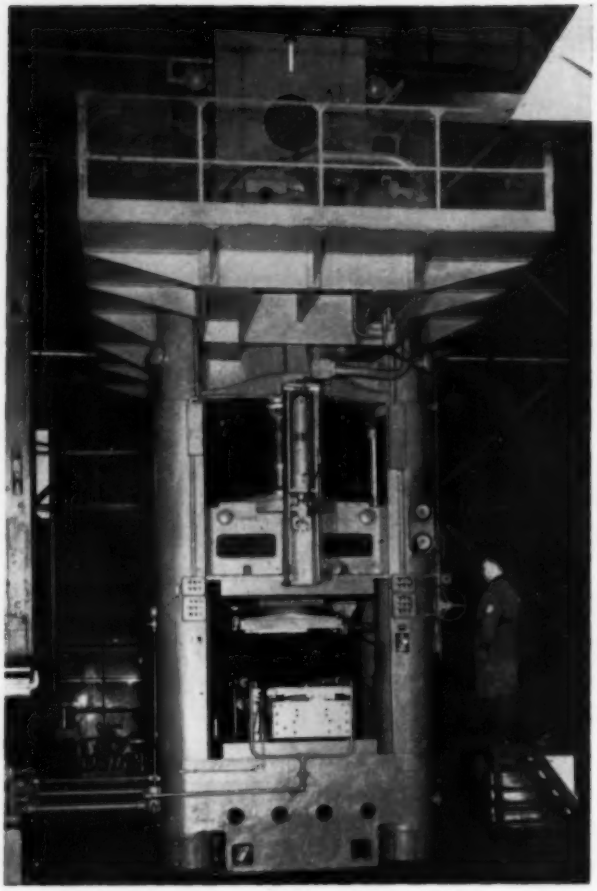
Centrifugally Spun TUBES for . . .

- ***ALL TYPES OF ROLLS***
- ***HYDRAULIC CYLINDERS***
- ***FURNACE TUBES***
- ***CHEMICAL RETORTS***
- ***MANY OTHER INDUSTRIAL APPLICATIONS***





ACIPCO STEEL centrifugally spun tubes were employed in the construction of the 1000 psi (above) and 2000 psi (below) hydraulic cylinders.



NEEDLESS TO SAY, the hydraulic press shown above and others like it must be built to withstand a lot of rugged punishment. Many of these industrial giants employ various types of hydraulic cylinders constructed of ACIPCO STEEL centrifugally spun tubes for shuttle feed use and the like.

ACIPCO STEEL tubes are serving in countless industrial uses and their exceptional value as a component in weldment applications is widely recognized. Tubes can be furnished in all the alloy grades including heat and corrosion resistant stainless steels as well as plain carbon grades. Special non-standard analyses are also available. ACIPCO tubes are manufactured in lengths up to 16 feet with wall thicknesses from .25" to 4". Outside diameters range from 2.25" to 50" and in large sizes ACIPCO tubes have a decided economical advantage over hollow-bored forgings.

In ACIPCO tubes there is an absence of directional lines of weakness found in hot rolled or cold drawn tubing. Tubes can be furnished rough as-cast, finished machined or honed to your specific need.

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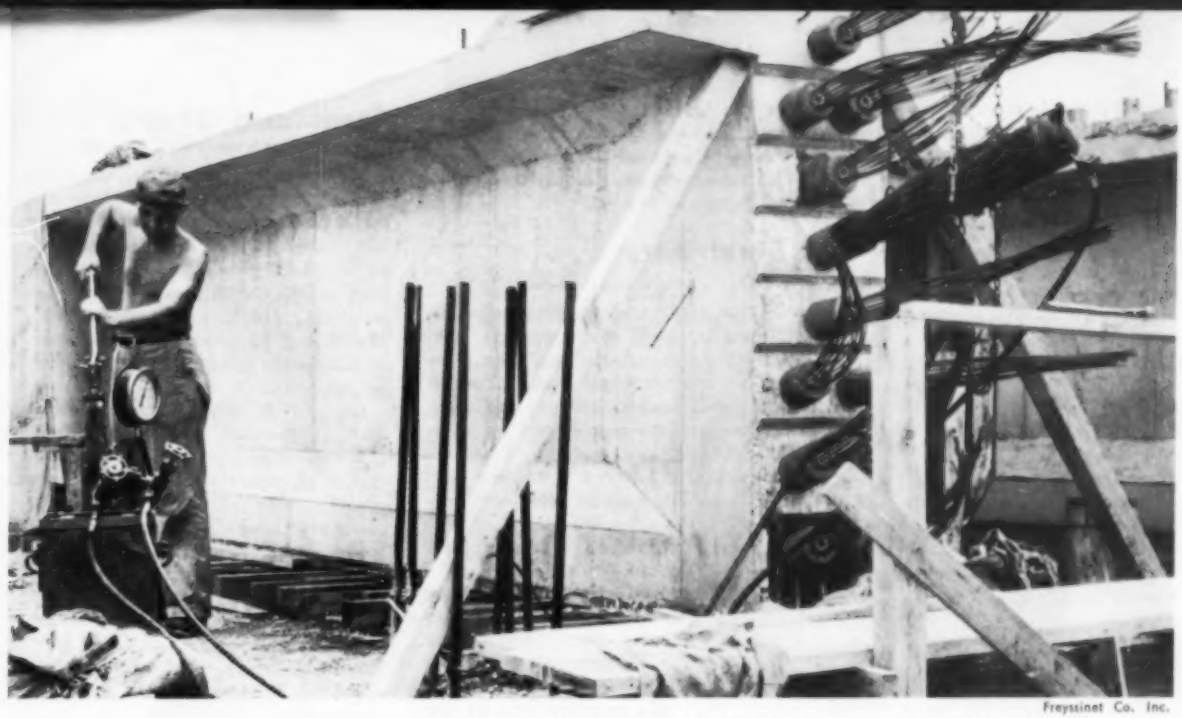

Freyssinet Co. Inc.

A worker with a hydraulic jack puts tension on the cables of a prestressed concrete girder. Growing acceptance of this construction method means that . . .

Wiremakers Find New High-Tension Market

IN THE EARLY 1900s, reinforced concrete was a comparative newcomer to the construction trade. Today, it is one of the most common construction materials, consuming large tonnages of concrete, reinforcing fabric and bars. In 1954, prestressed concrete takes the role of the newcomer; if it grows as rapidly as its "cousin," wiremakers can look forward to a healthy new market. Those most active in the field believe the potential for this building material is unlimited.

Only Two—"Those most active in the field" refers to American Steel & Wire Division of U. S. Steel Corp., Cleveland, and John A. Roebling's Sons Corp., Trenton, N. J., a subsidiary of Colorado Fuel & Iron Corp. These firms have done the most research and development on the wire used in prestressing in this country and produce virtually all the wire used for it.

The technique of prestressing concrete forms for structural purposes has been practiced for many years in Europe, but its introduction into the United States was fairly recent. Such companies as Freyssinet Co. Inc., New York, and Prestressed Concrete Corp. of Kansas, Kansas City, Mo., have done much to prove its use in the field.

Main use of prestressed concrete is in bridges. Many bridges for superhighways are designed for alternate bidding on this type of construction. For instance, the Lake Ponchartrain bridges for the Greater New Orleans Expressway constitute one of the largest projects using prestressed concrete. One section alone will consume at least 355 tons of high-tensile wire in the fabrication of beams. Alternates were also asked for the bridge approaches to Hampton Roads tunnel in Virginia and the Tampa bay bridges, two other large projects.

Branching Out—Uses are not restricted to bridges. Industrial buildings, schools, heavy machinery foundations and garages are a few of the other types of construction that have found linear prestressed concrete beams satisfactory and economical. Circular pretensioning, which can use wire of lower tensile strength, is used for concrete pressure pipe and circular structures.

The word prestressed covers two types of fabrication. In pretensioning individual wires or strands of wire are laid in forms and put under tension prior to pouring the concrete. When the concrete is poured it forms a bond with the wire. When a predetermined concrete strength is reached, the tension on the wires is released. This method is most used in a central plant where quality is of prime importance and transportation to the construction site offers no major problem. Because the bond would be weakened by any surface dirt, grease or corrosion, the wire cannot be stored for extended periods. This is a low-inventory product, and the mills work on current orders much of the time.

Protection—In the post-tensioning method, from 7 to 13 parallel wires are laid in place, protected by suitable tubes of paper, metal or plastic, and grouted with concrete as quickly as possible after the strands have been tensioned. The concrete is poured and allowed to reach a predetermined strength before tension is applied to the wires by jacking against the ends of the member and securing with special fittings. This type prestressing lends itself to field work.

Uncoated high-carbon wire with tensile strength approaching that of music wire is used for prestressing concrete. It is specially heat treated to relieve internal stresses set up in drawing and stranding. In Europe, where labor is cheaper, individual wires are used almost exclusively, but in the U. S. the trend is toward strand because of labor economies.

Wide Open Market—Because it is in its infancy here, most officials believe it will be 10 years before the volume of wire going into pre-

stressed concrete will be of much consequence in the over-all wire picture. But as the use grows, so will the number of companies that get into the act. Most wiremakers have the equipment, but so far they lack the know-how. American Steel & Wire officials stress that before a company enters this field, it should have several experimental projects standing to test its methods and materials. There are no formal specifications for the wire yet, but American Society for Testing Materials is studying the problem and may come up with specs.

One thing is certain: If prestressed concrete comes along as fast as reinforced concrete has over the last 50 years, there will be a terrific market for high-tensile wire in the near future.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 145 & 146

Climbing demand for the light, flat-rolled products highlights the current steel market.

Improvement is especially notable in cold-rolled sheets, deliveries of which now extend into December for some producers. Not only is automotive business gaining but appliance makers are coming into the market with larger tonnage, and, significantly, warehouses have resumed ordering.

One Pittsburgh district sheetmaker expects to produce at 100 per cent of capacity before the end of this quarter.

In the East buyers can still obtain cold-rolled tonnage within six weeks, hot-rolled within three weeks. In the Midwest some mills are almost sold out for this quarter. Galvanized sheets are the most extended, continuous-dipped shipments running 14 weeks and beyond.

Steel Bars . . .

Bar Prices, Page 144

With deliveries becoming more extended in some steel products, notably the flat-rolled items, consumers of commercial bars, both hot-rolled and cold-finished carbon and alloy grades, are showing more interest in the market.

Pittsburgh district mills are confident fourth quarter sales will surpass third quarter volume.

Defense contracts point to increased demand for alloy bars on a long term basis in New England. Shops have booked $40 million in orders for small arms. Substantial tonnage will be required for barrel stock, which will be die-rolled. More than half this tonnage will be for Connecticut shops.

The $18 million Army truck contract just awarded Mack Mfg. Co., Allentown, Pa., is expected to call for steel shipments by the first quarter of next year.

Tubular Goods . . .

Tubular Goods Prices, Page 148

Specialty tubing has been immune to the stepped-up buying of auto builders. Sales are still slow and subject to sharp competition. Capacity is ample for all fabricators' requirements. Seamless tubing is moving slowly, although sales of oil country goods continue strong.

Structural Shapes . . .

Structural Shape Prices, Page 144

Although structural fabricators are actively engaged, shop backlogs are less extended than they were a year ago. Competition for new business is increasingly sharp. In some instances, fabricators are going beyond their normal range of construction to line up orders. Some seasonal slackening is expected as the quarter advances.

Demand is diversified, but bridge work dominates at many points.

Wide flange beam production continues at capacity. Something of a supply pinch still prevails in this category, though New England structural shops report they are experiencing no difficulty.

Bethlehem Steel Co. is low bidder at $7,948,106 on the superstructure of a proposed bridge across the Rappahannock river. Bid is subject to approval by the Virginia Highway Commission.

September Steel Output Up

Steel production is rising. Output of ingots and steel for castings in September registered an increase of 104,000 tons over that for August. The month's total was 6,771,000 net tons against 6,666,907 for the previous month. Production in August was 39,000 tons greater than that in July, the low month for the year.

Steel output the first nine months of this year was 64,197,136 net tons —equal to 69 per cent of capacity. It compares with production of 85,510,617 tons in the like period of last year.

Period	OPEN HEARTH Net tons	OPEN HEARTH Per cent of capacity	OPEN HEARTH ‡Index	BESSEMER Net tons	BESSEMER Per cent of capacity	BESSEMER ‡Index	ELECTRIC Net tons	ELECTRIC Per cent of capacity	ELECTRIC ‡Index	TOTAL Net tons	TOTAL Per cent of capacity	TOTAL ‡Index	Calculated weekly production (Net tons)	Number of weeks in month
1954														
January	7,256,526	78.3	113.3	280,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,645,508	4.43
1st Qtr.	20,429,406	75.9	109.9	662,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,950	12.86
April	6,365,326	70.9	102.7	162,457	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,738	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,485	4.29
2nd Qtr.	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
July	6,040,120	65.3	94.3	205,313	50.6	58.4	382,164	43.1	107.0	6,627,597	62.9	93.2	1,499,456	4.42
*Aug.	6,021,496	65.0	94.0	217,837	53.6	62.0	427,574	48.2	119.7	6,666,907	63.1	93.7	1,504,945	4.43
*Sept.	6,109,000	68.2	98.6	214,000	54.5	62.9	448,000	52.2	129.6	6,771,000	66.3	98.4	1,582,000	4.28
†3rd Qtr.	18,170,616	66.1	95.6	637,150	52.9	61.1	1,257,738	47.8	118.7	20,065,504	64.1	95.0	1,528,218	13.13
†9 Mos.	58,485,305	71.7	103.7	1,847,968	51.6	59.7	3,863,863	49.4	122.8	64,197,136	69.0	102.5	1,646,080	39.0
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,962	99.1	139.1	2,234,303	4.43
February	7,939,299	100.8	137.2	329,389	92.6	103.8	664,081	84.6	205.9	8,932,779	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,815	87.7	213.5	10,168,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,789	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,502	99.4	135.4	332,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st Half	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	129.8	324,068	82.4	92.2	635,263	73.2	177.9	9,275,673	93.1	130.4	2,098,569	4.42
Aug.	8,463,155	97.0	132.1	310,074	78.7	88.2	632,351	72.7	177.0	9,405,580	94.2	132.2	2,123,156	4.43
Sept.	8,076,277	95.8	130.3	287,638	75.6	84.6	519,513	61.9	150.3	8,883,428	92.1	129.0	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,787,127	69.4	168.6	27,564,681	93.1	130.6	2,099,386	13.13
9 Mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	6,032,197	78.8	191.8	85,510,617	97.3	136.5	2,192,580	39.00

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 280,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.

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Semifinished Steel . . .

Semifinished Prices, Page 144

Steelmaking operations in the Chicago district were curtailed for a time last week. Heavy rains caused power shortages. Two generating stations of Commonwealth Edison Co. were shut down. Seventeen of the company's largest consumers were ordered to cut power use by nearly 100 per cent.

Imports Hit Gulf Coast Market

Foreign competition for Gulf states steel markets has probably leveled off, but it is still hurting area producers. One estimate is that about 30,000 tons of foreign steel a month are coming into the Port of Houston, mostly from Belgium and Luxembourg plus some from France and Japan. Sheffield Steel Division of Armco Steel Corp. says its operations in that area would be 15 per cent higher were it not for the influx of foreign products such as reinforcing bars.

Pricewise, the imports are often under domestic quotations. Often the basic price is about the same, or in some cases higher than domestic prices, but extras are about $15 a ton under U. S. extras.

Even though the peak has been reached, there is no guarantee that volume will not go up at any time. Delivery holds the key to the problem. In July, you could get delivery only as long as it took to ship it from the European mill to the user. As of Oct. 1, foreign producers for users in the Houston area were able to give only December and January delivery. Rising European business is filling their order books.

But the area's producers are optimistic about the rest of 1954 and early 1955.

Warehouses, too, are optimistic. One large warehouse reports first-half business off only 17 per cent from the like period of 1953.

Pig Iron . . .

Pig Iron Prices, Page 140

Pig iron orders are reaching sellers in larger volume. Much demand is for spot shipment, with foundries carrying minimum inventories. But sellers' order books are fuller today than a month ago.

Most foundries are operating four to five days a week. Melters attribute improvement in operations to reduced inventories of castings; some say seasonal factors are exerting a stronger influence.

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Warehouse . . .

Warehouse Prices, Page 149

Extension of the county-basing delivered price system to all Ohio warehouses looks like a good bet. Joseph T. Ryerson & Son Inc. instituted the new system in its Cleveland, Cincinnati and Pittsburgh plants, making the system statewide for that large warehouse chain. Similar action was taken several weeks before by Brown Steel Co., Columbus, O. Now Brown has revised its listings to meet those of Ryerson where necessary.

Several other areas have been trying out the simplified pricing with reported good results. Horace T. Potts Co., Philadelphia, applied the system a month ago. Dolan Steel Co. Inc., Bridgeport, Conn., which put the system into effect in January of this year, reports that advantages have outweighed disadvantages so far. It is especially helpful for potential customers who are estimating on a job. They can determine prices immediately. Under the old system, it takes a lot of time to study extra tables and freight rates to arrive at a figure that is only a rough guess.

West-Coast warehousemen have no immediate plans to follow the trend toward the revision of quantity deduction schedules on some products.

Eastern warehouses reduced prices $2 to $4 per ton on larger quantities by increasing deductions on tonnage shipments above the base bracket—2000 to 4999 lb. At the same time, they increased the mark-up for smaller than base bracket shipments of hot-rolled products, cold-finished bars and sheets: Under 100 lb $6 is added instead of $4; 100 to 399 lb, $3 instead of $2; 400 to 999 lb, $1.25 instead of 85 cents; and 1000 to 1999 lb, 30 cents instead of 20 cents.

Plates . . .

Plate Prices, Page 144

Quickening general demand for steel products has barely spread to plates. So far, October sales volume shows little change from that of September, except for spotty purchases. Mill deliveries are available within two weeks. Under the circumstances, consumers continue to order hand-to-mouth, although excessive inventories have long since been worked off.

Small fabricators appear to have depleted their stocks, and this appears in slightly better demand for use in building boilers and stacks. Water tank fabricators are experiencing a continued drop in industrial requirements, reflecting the slump in plant construction.

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STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electromanganese: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.05c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.05c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.75c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.9c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.50 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, Pa., $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical CONTROL
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Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, *ALLOYMET* 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

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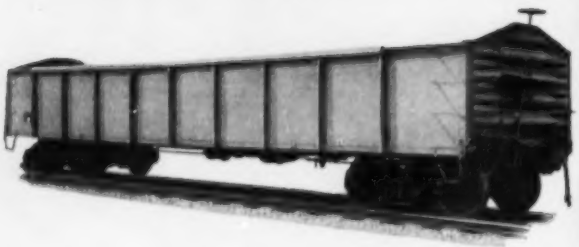

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Capacity, Nominal	100,000 Lbs.
Load Limit	125,000 Lbs.
Light Weight, Approx.	43,000 Lbs.
Length, Inside	41 Ft. 3 In.
Width, Inside	9 Ft. 3 In.
Height, Inside	4 Ft. 4 In.
Cubic Capacity	1,698 Cu. Ft.

Complete Information on Request

20 and 30 Cubic Foot Air-Dump Cars Also Available

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CHICAGO FREIGHT CAR... and parts co.
CHICAGO, ILL. AUBURN, WASH. PUEBLO, COLO.

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By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages **4 tables**
69 illustrations **Price $5.00 Postpaid**

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Book Department, 1213 W. 3rd St., Cleveland 13, O.

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.80-$4.20
60-65%	4.65-4.75

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala. $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.80; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Pa., $183.50; Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, deadburned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85*
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net ton, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam. (Inches)	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5¼	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.00
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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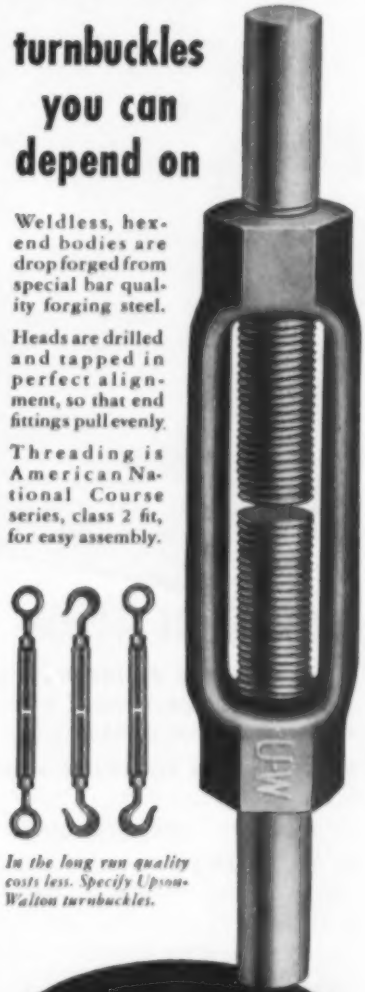
turnbuckles you can depend on

Weldless, hex-end bodies are drop forged from special bar quality forging steel.

Heads are drilled and tapped in perfect alignment, so that end fittings pull evenly.

Threading is American National Course series, class 2 fit, for easy assembly.



In the long run quality costs less. Specify Upson-Walton turnbuckles.

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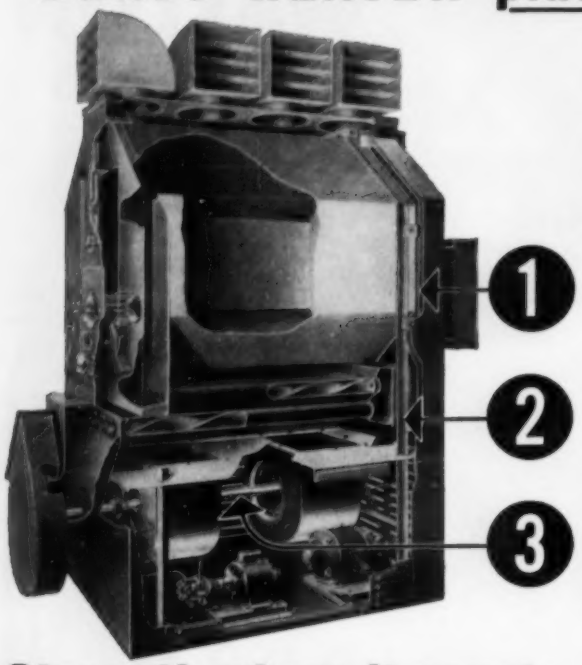

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2. Heavy duty structural steel framework gives more strength to heater . . . permits safe wall-mounting or suspension from ceiling to save floor space.

3. Strong large-diameter fan shaft carries all air supply fans and exhauster . . . reduces number of working parts . . . adds extra life to heaters.

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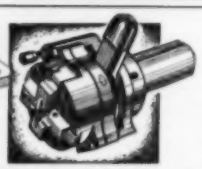

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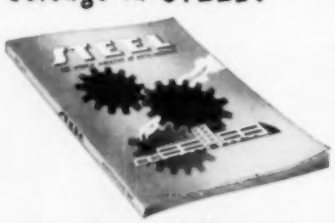

You advertise in STEEL to reach ALL 4 buying influences . . .
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Scrap . . .

Scrap Prices, Page 162

Boston—Prices on top grades of scrap steel are stronger for domestic shipment and export. Close to 40,000 tons have been shipped or are being loaded for export. Bulk of the steel scrap tonnage is coming from yards within 50 miles of Boston. No. 1 bundles are notably strong.

New York — Scrap trading continues brisk with domestic and export buyers showing lively interest. Brokers advanced buying prices on machine shop turnings to a range of $9 to $10, on short shovel turnings $12 to $13.

Buffalo—Large orders placed by the district's two leading mill consumers paced a spirited buying wave in the scrap market, boosting prices an additional 50 cents to $2 per ton. The mills bought at $4 above their last purchases. Interim gains were scored on other buying.

A rise of two points in the area's ingot production rate to 70.5 per cent of capacity was the major bullish factor in the market. Outside buying, however, provided support. Canadian demand led to a further jump of $1 per ton on cast grades.

Philadelphia—Prices on major open-hearth grades of scrap are unchanged but there is an increase in low phos structurals and plate and couplers, springs and wheels of $1 a ton to $34, delivered. Also, prices on rail crops, 2-feet and under, have advanced to $45 delivered. Cast iron grades are unchanged.

Although prices on melting steel and bundles are unchanged, the market undertone remains strong. There is not likely to be quite the export movement from this port in October due to increasing short supply.

Pittsburgh — Improving sentiment in the scrap market is reflected in rising prices, although No. 1 heavy melting remains unchanged. Turnings, borings and railroad scrap increased last week. Machine shop turnings are quoted at $18-$19.

Washington — Consumption of ferrous scrap during August increased 7 per cent over July, reports the Bureau of Mines. Pig iron consumption also was slightly higher. As a result, total ferrous melt (scrap and pig iron) for the month was 8,178,000 gross tons, of which 50.9 per cent was scrap and 49.1 per cent pig iron. This compares with 49.6 and 50.4 per cent, respectively during July.

Stocks of scrap held by consumers totaled 5,887,000 tons at the end of August, an increase of 2 per cent over end of July.

Cleveland—Moderate purchases of steelmaking scrap were made by area mills over the past week or so but prices are unchanged. No. 1 heavy melting sold up to $33, but material still is moving on old contracts at $31. No. 2 bundles sold up to $27, about $1 more than is currently commanded in the Valley.

The market continues strong but the bullishness shown a week ago is less in evidence. District mill stocks are described as fair. A little more material is moving from fabricating plants with manufacturing operations tending upward.

Cincinnati — Strong market de-

(*Please turn to page* 164)

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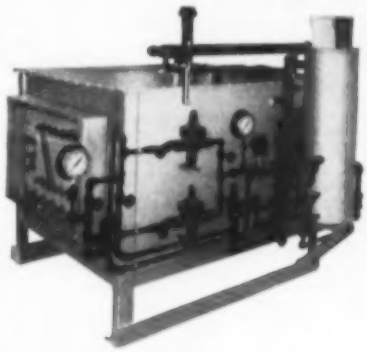

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182 Weeden Street, Pawtucket, R. I.

Electric and Fuel-Fired Furnaces
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Gas Conditioning Equipment

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 13	$32.00
Oct. 6	32.00
Sept. Avg.	29.94
Oct., 1953	32.75
Oct., 1949	26.71

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	32.00-33.00
No. 2 bundles	26.00-27.00
No. 1 busheling	31.00-32.00
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*20.00-21.00*
Cut structurals, 5 ft lengths	33.00-34.00
Heavy turnings	*28.00-29.00*
Punchings & plate scrap	35.00-36.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	32.00-33.00
Heavy breakable cast	31.00-32.00
Unstripped motor blocks	23.00-24.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	*34.00-35.00*
Rails, 2-ft and under	*44.00-45.00*
Rails, 18-in. and under	*45.00-46.00*
Rails, random lengths	*38.00-39.00*
Railroad specialties	*36.00-37.00*

Stainless Steel Scrap

18-8 bundles & solids	180.00-190.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	31.00-33.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	31.00-33.00
No. 2 bundles	*25.00-27.00*
No. 1 busheling	31.00-33.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	*33.00-34.00*
Cut structural plate 2 ft and under	36.00-37.00
Alloy free, short shovel turnings	20.00-21.00
Electric furnace bundles	31.00-33.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	27.50-28.50
Stove plate	34.00-35.00
Heavy breakable cast	26.50-27.50
Unstripped motor blocks	25.00-26.00
Brake shoes	30.00-31.00
Clean auto cast	44.00-45.00
No. 1 wheels	36.00-37.00
Burnt cast	28.00-29.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	43.00-44.00
Rails, 3-ft and under	45.00-46.00
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	42.00-43.00
Cast steel	36.00-37.00
Railroad specialties	36.00-37.00
Uncut tires	37.00-38.00
Angles, splice bars	42.00-43.00
Rails, rerolling	50.00-51.00

Stainless Steel (F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	34.00-36.00
No. 2 heavy melting	28.00-30.00
No. 1 bundles	34.00-36.00
No. 2 bundles	25.00-26.00
Machine shop turnings	14.00-15.00
Short shovel turnings	*21.00-22.00*
Cast iron borings	*21.00-22.00*
Low phos.	34.00-36.00
Electric furnace bundles	34.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	32.00-34.00
No. 2 heavy melting	*31.00-32.00*
No. 1 factory bundles	*34.00-35.00*
No. 1 dealer bundles	*33.00-34.00*
No. 2 bundles	23.50-24.50
No. 1 busheling	32.00-34.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3-ft	*35.00-36.00*
Punchings & plate scrap	*35.00-36.00*
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	33.00-34.00
Unstripped motor blocks	25.00-26.00
Clean auto cast	*43.00-45.00*
Drop broken machinery	*43.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*
R.R. malleable	42.00-44.00
Rails, 2-ft and under	*49.00-50.00*
Rails, 18-in. and under	*50.00-51.00*
Angles, splice bars	42.00-43.00
Rails, rerolling	*52.00-53.00*

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00
430 turnings	20.00-25.00

Chicago Mercantile Exchange

No. 1 Heavy Melting (Week ended Oct. 13)

	High	Low	Close
Jan.	38.000	37.875	37.875
Mar. (nom.)	38.500	38.500	38.500

Sales (40-ton units): 2 January.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.50
No. 1 bundles	27.50
No. 2 bundles	20.00
No. 1 busheling	26.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	16.00
Punchings & plate scrap	27.00

Cast Iron Grades

No. 1 cupola	34.00
Charging box cast	27.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.50-28.50*
No. 2 heavy melting	*24.50-25.50*
No. 1 bundles	*27.50-28.50*
No. 2 bundles	*20.50-21.50*
No. 1 busheling	*27.50-28.50*
Machine shop turnings	14.50-15.50
Mixed borings, turnings	14.50-15.50
Short shovel turnings	14.50-15.50
Cast iron borings	14.50-15.50
Low phos. 18-in.	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	36.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths	38.00-39.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	30.50
No. 2 heavy melting	28.50
No. 1 bundles	30.50
No. 2 bundles	25.00
No. 1 busheling	28.50-29.00*
Electric furnace bundles	31.50
Machine shop turnings	16.50-17.00
Mixed borings, turnings	19.00
Short shovel turnings	20.00
Structurals & plate	*34.00*
Heavy turnings	28.00
Couplers, springs, wheels	*34.00*
Rail crops, 2 ft & under	*45.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Malleable	37.00*
Heavy breakable cast	36.00
Drop broken machinery	41.00-42.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	26.00
No. 2 heavy melting	24.00
No. 1 bundles	26.00
No. 2 bundles	20.00
Machine shop turnings	*9.00-10.00*
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	29.00-30.00
Short shovel turnings	*12.00-13.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	19.00-20.00*

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00*
No. 2 heavy melting	18.00
No. 1 bundles	22.00
No. 2 bundles	*22.00-23.00*
Mixed borings, turnings	10.00-10.50
Machine shop turnings	*7.50-8.00*
Short shovel turnings	11.00-11.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

* $4 to $4.50 higher for export.

BUFFALO

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	*26.50-27.50*
No. 1 bundles	30.00-31.00
No. 2 bundles	*24.50-25.50*
No. 1 busheling	30.00-31.00
Machine shop turnings	15.50-16.50
Mixed borings, turnings	17.50-18.00
Short shovel turnings	18.50-19.00
Cast iron borings	17.50-18.00
Low phos.	*33.00-34.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	*41.00-42.00*

Railroad Scrap

Rails, random lengths	*35.00-36.00*
Rails, 3 ft and under	*42.00-43.00*
Railroad specialties	*36.50-37.50*

BIRMINGHAM

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*23.00-24.00*
No. 2 bundles	*19.00-20.00*
Cast iron borings	16.00-17.00
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	*29.00-30.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	*32.00-33.00*
Structural plate, 2 ft	*32.00-33.00*
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	*30.00-31.00*
Rails, 18-in. and under	*40.00-41.00*
Rails, rerolling	40.00-41.00
Angles, splice bars	*38.00-39.00*
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	30.00
No. 2 bundles	24.00
Machine shope turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	38.00
Charging box cast	29.00
Heavy breakable cast	29.00
Unstripped motor blocks	29.00
Brake shoes	30.00
Clean auto cast	40.00
Stove plate	34.00

Railroad Scrap

No. 1 R.R. heavy melt	35.00
Rails, 18-in. and under	46.00
Rails, random lengths	45.00
Rails, rerolling	53.50
Angles, splice bars	42.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	25.00
No. 2 heavy melting	21.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	34.00-35.00
Heavy breakable cast	23.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

HAMILTON, ONT.

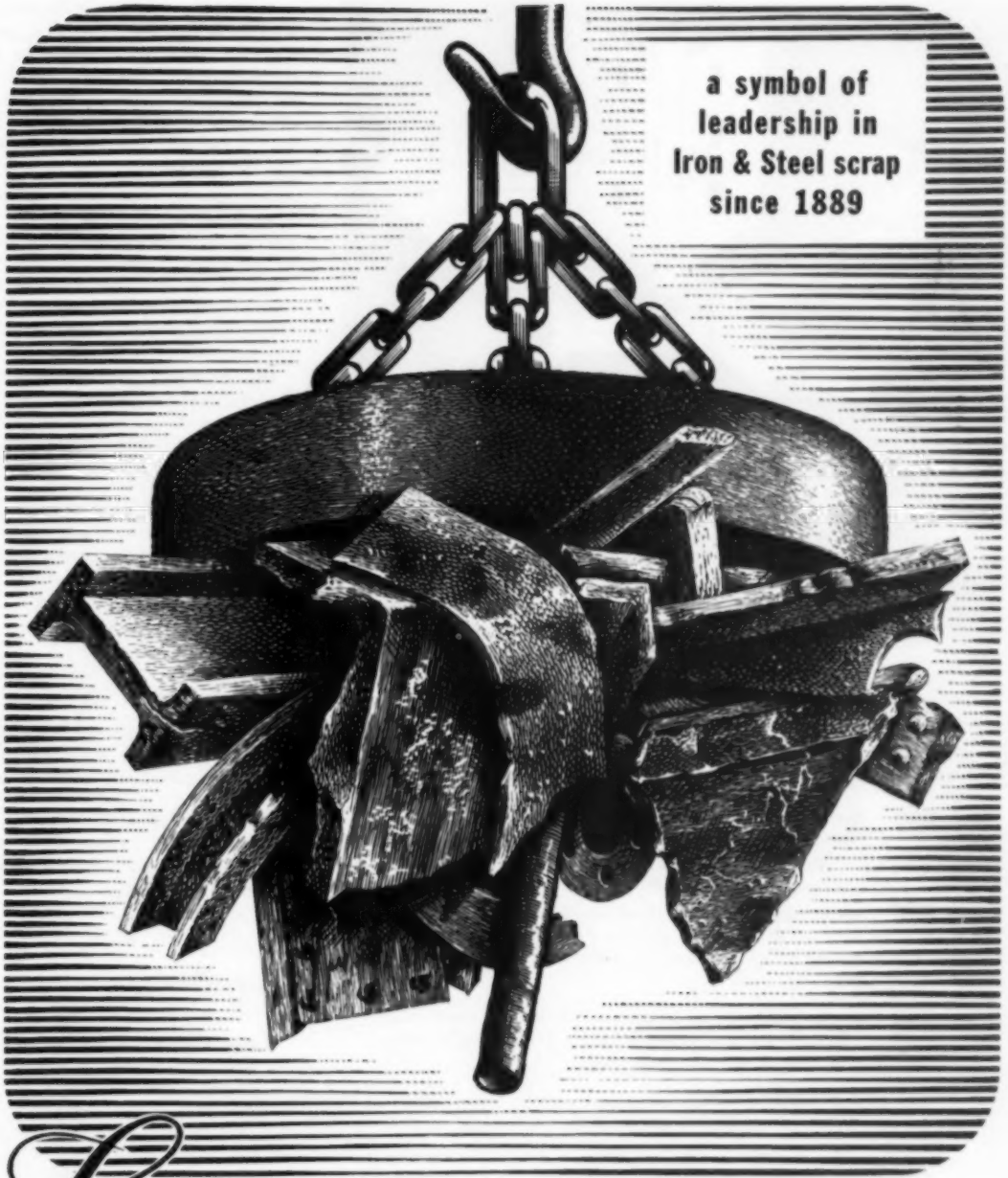
(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



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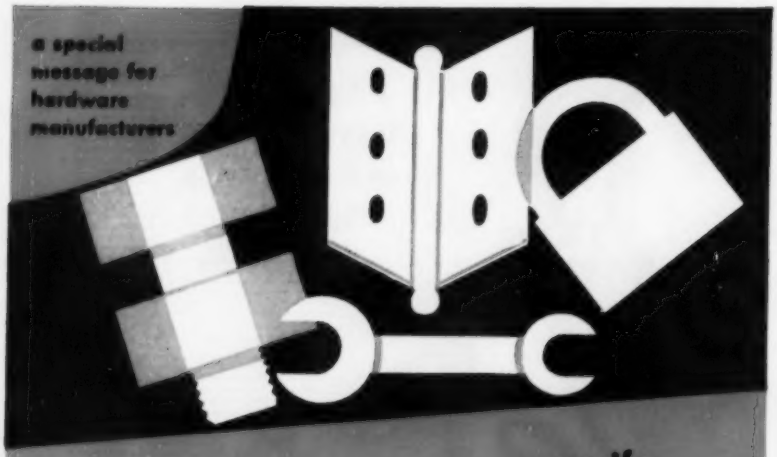

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(*Concluded from page* 161)

veloped in the Cincinnati area, sweeping No. 1 and No. 2 grades of scrap up another $1. The No. 1 grades rose to $27.50 to $28.50. No. 2 heavy melting is quoted at $24.50 to $25.50. No. 2 bundles are up to $20.50 to $21.50.

Chicago—Recent price gains in steel scrap are holding despite light trading volume. Strong tone is supported by a continuously improving steelmaking rate. Last week steel operations were reduced somewhat by the flood in the Chicago area. Scrap yard activity suffered, too.

Birmingham — Foreign demand is largely behind current price increases on steel scrap in this section. Considerable tonnage continues to move from Gulf and Atlantic coast ports.

Portland, Oreg.—Cast scrap prices are stronger than those quoted on steel grades due to shortage of the former. No. 1 and No. 2 heavy melting are quoted at $25 and $21, respectively.

San Francisco—Outlook for the scrap market is improving. The steady gain in mill operations is a bolstering factor.

Los Angeles—Scrap dealers, dismayed by lagging sales charts, are consoling themselves with memories of last year's fourth quarter when steel mills nearly depleted dealers' stocks. Only a similar burst of mill purchases will prevent 1954 sales volume from dropping at least 15 per cent below that of 1953, most dealers say.

Iron Ore . . .

Iron Ore Prices, Page 159

Lake Superior iron ore shipments for the 1954 season to Oct. 11 total 53,129,833 gross tons—off about 30 million tons from shipments in the like period of 1953. Tonnage moved in the latest week of record, that ended Oct. 11 was 1,633,120 tons, more than 1 million tons below shipments in the corresponding week of last year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, The Dalles project, to various fabricators in Oregon, Nevada and Washington state; Atkinson-Ostrander, joint general contractors.

1550 tons, apartment and garage, Bowery Savings Bank, St. Nicholas Ave. and 145th St., New York, through Irons & Reynolds, general contractors, to Bethlehem Steel Co., Bethlehem, Pa.

1450 tons, section of state turnpike extension, Montgomery county, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

1290 tons, office, Diesel Construction Co., Ann and William Sts., New York, to Harris Structural Steel Co., that city.

1075 tons, Litz Department Store, Camden, N. J., to Belmont Iron Works, Eddystone, Pa.

1070 tons, section, state turnpike, Montgomery county, Pa., through Latrobe Road Construction Co., Inc., to Pittsburgh Bridge & Iron Works, Pittsburgh.

700 tons, plant, National Lead Co., to Mississippi Valley Structural Steel Co., St. Louis.

686 tons, state bridge, Montgomery county, N. Y., through Grow Construction Co., general contractor, to Mt. Vernon Bridge Co., Mt. Vernon, O.

540 tons, state bridge, Broome county, N. Y., through Grow Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

460 tons, structures for pre-flight facilities, Larson Air Field, Moses Lake, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Donald M. Drake Co., Portland, Oreg., general contractor.

400 tons, state bridges, Orange-Athol, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; S. & M. Construction Co., Inc., Providence, R. I., general contractor.

385 tons, warehouse, New Brunswick, N. J., throug Walter Kidde Construction Inc., general contractor, to Grand Iron Works, New York.

295 tons, state bridge, Sullivan county, N. Y., through Lane Contracting Corp., Meriden, Conn., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

280 tons, state bridge, Columbia county, N. Y., through White Oaks Excavators Inc., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, state bridges, Billerica-Chelmsford, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Coleman Bros., Corp., Boston, general contractor.

275 tons, Long Island Railroad bridge, through Hendrickson Bros., general contractors, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, administration building, Hadassah Women's Zionist Organization of America, East 52nd St., New York, to Schacht Steel Construction Inc., that city.

240 tons, galvanized steel for sub-station, to Creamer & Dunlap, Tulsa, Okla., $95,958, by Bonneville Power Administration.

230 tons, galvanized transmission towers, Jersey Central Power & Light Co., Sayreville, N. J., to Bethlehem Steel Co., Bethlehem, Pa.

215 tons, office and store building, Queens boulevard, Jamaica, Long Island, N. Y., to Spofford Steel Fabricators Inc., Bronx, New York.

200 tons, bridge, Oregon road project, to Poole, McGonigle & Dick, Portland, Oreg.

175 tons, factory building, Howell Mfg. Co., Paoli, Pa., to Belmont Iron Works, Eddystone, Pa.

165 tons, shopping center, Brooklyn Park, Md., to Belmont Iron Works, Eddystone, Pa. This project was referred to in a recent issue as involving 125 tons.

135 tons, state highway bridge, Bedford, N. H., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

100 tons, Oregon state road work, to Poole, McGonigle & Dick, Portland, Oreg.

STRUCTURAL STEEL PENDING

13,500 tons, structural tunnel lining, Hampton Roads, Va., State Highway Department, bids closed.

6000 tons, New Jersey approach, Philadelphia-Gloucester bridge, Delaware River Port Authority; bids Nov. 10.

4800 tons, state turnpike bridge construction, Hudson county, New Jersey, bids Oct. 21.

4325 tons, state turnpike work, Hudson county, New Jersey, bids Oct. 19.

3000 tons, Carling's Brewery buildings, Natick, Mass.; taking bids.

2500 tons, high bay hangar, air flight facilities, Moses Lake, Wash.; Donald M. Drake and George A. Fuller, Portland, Oreg., apparently low at $1,616,000 to Boeing Airplane Co., Seattle.

2000 tons, double cantilever maintenance hangar, Otis Airfield Base, Falmouth, Mass.; bids Oct. 29, Corps of Engineers, Boston.

1800 tons, bascule bridge, over Eastchester creek, Bronx county, New York, bids Oct. 28; this is one of four thruway projects in Bronx and Westchester counties scheduled for that date, linking up the main North-South artery with New England thruway developments.

1300 tons, state bridge work, Niagara county, New York.

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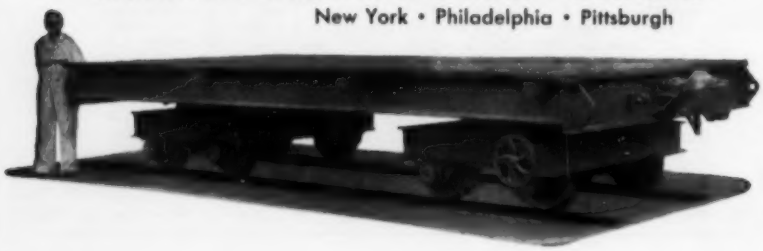

925 tons, six state bridges, Everett, Mass.; bids Oct. 26, Boston.

680 tons, highway bridges, St. Joseph county, Indiana; bids Oct. 20, Indiana Toll Road Commission, Indianapolis.

500 tons, section, Queens expressway, Triboro Bridge & Tunnel Authority, New York; bids Oct. 20.

840 tons, section, state turnpike, Montgomery and Bucks counties, Pa.; C. J. Langenfelder, Baltimore, low on general contract.

230 tons, three state bridges, Norwich-Franklin, Conn.; bids Oct. 25, Hartford, Conn.

REINFORCING BARS . . .

REINFORCING BARS PLACED

800 tons, Oregon state highway projects, to various suppliers in the Portland, Oreg., area.

200 tons, state highway bridges, Orange-Athol, Mass., to Plantations Steel Co., Providence, R. I.; S. & M. Construction Co., Inc., Providence, general contractor.

REINFORCING BARS PENDING

5000 tons or more, non-overflow dam and other structures, The Dalles project, Columbia river; bids to U. S. Engineer, Portland, Oreg., Dec. 15.

1000 tons, addition to Gorge dam, Skagit river project; bids to Seattle postponed to Nov. 10 from Oct. 20.

435 tons, six state bridges, Everett, Mass.; bids Oct. 26, Boston.

260 tons, highway bridges, St. Joseph county, Indiana; bids Oct. 20, Indiana Toll Road Commission, Indianapolis.

200 tons, twin girder Washington state highway bridges, Spokane county; Henry Hagman, Cashmere, Wash., low at $166,170.

140 tons, three state bridges, Norwich-Franklin, Conn.; bids Oct. 25, Hartford, Conn.

100 tons, Washington state highway span, Kitsap county; B. L. Moss & Co., Zenith, Wash., low at $64,946.

PLATES . . .

PLATES PLACED

765 tons, tank, California Oil Co., Perth Amboy, N. J., to Chicago Bridge & Iron Co., Chicago.

400 tons, two tanks, Socony Vacuum Oil Co., Staten Island, New York, to Chicago Bridge & Iron Co., New York.

PLATES PENDING

325 tons, black, medium tensile, Navy Purchasing Office, Washington; Inv. 504, Oct. 21.

150 tons, replacement of water tanks, naval construction battalion center, Davisville, R. I.; bids Oct. 14, First Naval District, Boston.

120 tons, fuel storage tank, Westover Airfield Base, Chicopee Falls, Mass.; bids Oct. 22, Corps of Engineers, Boston.

100 tons, fuel storage tank, Dow Airfield Base, Bangor, Me.; bids Oct. 29, Corps of Engineers, Boston.

PIPE . . .

CAST IRON PIPE PENDING

1400 tons, for municipal uses; bids in to Spokane, Wash., Oct. 7.

220 tons, award pending, Eugene, Oreg.

STEEL PIPE PENDING

100 tons or more, 3900 ft 12-in. addition to water system, Veterans' hospital, Camp White, Oregon; bids to Veterans Administration, Washington, D. C., Nov. 9.

RAILS, CARS . . .

RAILROAD CARS PLACED

Canadian National, 110 seventy-ton flat cars, to Canadian Car & Foundry Co., Montreal.

Lehigh Valley, 100 gondolas, to Bethlehem Steel Co., Bethlehem, Pa.

Missouri-Kansas-Texas, six passenger coaches, to Pullman Standard Car Mfg. Co., Chicago. These are in addition to 500 box cars placed with the same builder.

Missouri-Kansas-Texas, 500 box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Railway Express Agency, 300 refrigerator cars to General American Transportation Corp., Chicago.

Advertising Index

Abrasive Products, Inc. 136
Acme Steel Co., Acme Steel Products Division 119, 120, 121, 122
Ajax Electric Co. 13
Alan Wood Steel Co. 58
Allegheny Ludlum Steel Corporation 24
Allied Research Products, Inc. 164
Allis-Chalmers 25
Alter Co., Alloy Metal Division 157
Aluminum Company of America 107, 108, 109, 110
American Cast Iron Pipe Co. 150
American Chain & Cable, Wire Rope Sling Department 10
American Society for Metals 34
American Steel & Wire Division, United States Steel Corporation 26
Anaconda Wire & Cable Co. 85
Armco Steel Corporation 43

Babcock & Wilcox Co., The, Tubular Products Division Inside Front Cover
Barium Steel Corporation 35
Bethlehem Steel Co. 1
Birdsboro Steel Foundry & Machine Co. 168
Bixby, R. W., Inc. 165
Bristol Brass Corporation, The 136
Browning, Victor R., & Co., Inc. 160
Buffalo Forge Co. 36
Bullard Co., The 38, 39

Carpenter Steel Co., The, Alloy Tube Division 21
Central Steel & Wire Co. 37
Chase Brass & Copper Co. 139
Chicago Freight Car & Parts Co. 158
Cincinnati Shaper Co., The 11
Clark Bros. Co., Division of Dresser Operations, Inc. 103
Cleveland-Cliffs Iron Co., The 22
Cleveland Steel Tool Co., The 158
Collins Engineering Co. 165
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 75
Columbia-Geneva Steel Division, United States Steel Corporation 26
Columbus McKinnon Chain Corporation 127
Consolidated Industries, Inc. 143
Continental Foundry & Machine Co. 89
Continental Tool Works, Division of Ex-Cell-O Corporation 4
Crucible Steel Company of America 153

Diamond Mfg. Co. 160
Drava Corporation, Heating Department 160
Dresser Operations, Inc., Clark Bros. Co. Division 103
Duriron Co., Inc., The 27

Eastern Machine Screw Corporation, The 160, 165
Easton Car & Construction Co. 166
Electric Controller & Mfg. Co., The 44
Ex-Cell-O Corporation 5
Ex-Cell-O Corporation. Continental Tool Works Division 4

Fairbanks, Morse & Co. 76
Falk Corporation, The 32
Farval Corporation, The Inside Back Cover
Fischer Special Manufacturing Co. 84

General Electric Co. 30, 31

H & P Die & Stamping Co. 158
Habart Brothers Co. 3
Hyatt Bearings Division, General Motors Corporation 62

Illinois Clay Products Co. 116
Industrial Brownhoist Corporation 80
International Nickel Co., Inc., The 40
Iron & Steel Products, Inc. 165

Joliet Wrought Washer Co. 161
Jones & Lamson Machine Co. 90
Jones & Laughlin Steel Corporation 129

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 23

Lapointe Machine Tool Co., The 8, 9
Libby-Owens-Ford-Glass Co., Carrulux Division 113
Lincoln Electric Co., The 6
Lurie Brothers & Co., Inc. 163

Mackintosh-Hemphill Co. 134, 135
Marvellum Co., The 69
Michigan Crane & Conveyor Co. 86
Midvale Co., The 99
Milford Rivet Machine Co., The 47
Morgan Construction Co. 57
Morgan Engineering Co., The 101
Mundt, Charles, & Sons 167

National Airoil Burner Co., Inc. 81
National Steel Corporation 125
New Britain Machine Co., The 17, 18, 19, 20
New Departure, Division of General Motors 65
Newport Steel Corporation 141
New York & New Jersey Lubricant Co. 154
Niagara Blower Co. 12

Ohio Steel Foundry Co., The 70

Pearless Steel Specialties Co. 165
Pennsylvania Salt Manufacturing Co. 29
Phillips Petroleum Co. 2
Pittsburgh Crushed Steel Co. 161
Pittsburgh Engineering & Machine Co., Division of Pittsburgh Steel Foundry Corporation 7
Pratt & Whitney Division Niles-Bement-Pond Co. 82, 83

Republic Steel Corporation 133
Republic Steel Corporation, Alloy Steel Division 87

Sargeant & Wilbur, Inc. 161
Seaboard Steel Co., Inc. 165
Simonds Abrasive Co. 79
Stamco, Inc. 138
Standard Pressed Steel Co. 48
Steel Equipment Co. 28
Steel Shot & Grit Co. 161
Superior Tube Co. 73

Taylor, Frank H., & Son, Inc. 166
Tempil Corporation 68
Tennessee Coal & Iron Division, United States Steel Corporation 26
Timken Roller Bearing Co., The, Steel & Tube Division 66

United States Pipe & Foundry Co., Special Products Division 14, 15
United States Steel Corporation, Subsidiaries 26
United States Steel Export Co. 26
Upson-Walton Co., The 159

Victor Saw Works, Inc. 16

Wean Engineering Co., Inc., The Back Cover
Weirton Steel Co. 125
Wheeling Steel Corporation 158
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 75

Youngstown Sheet & Tube Co., The 33

Table of Contents, Page 5

Classified Advertising, Page 165

MUNDT

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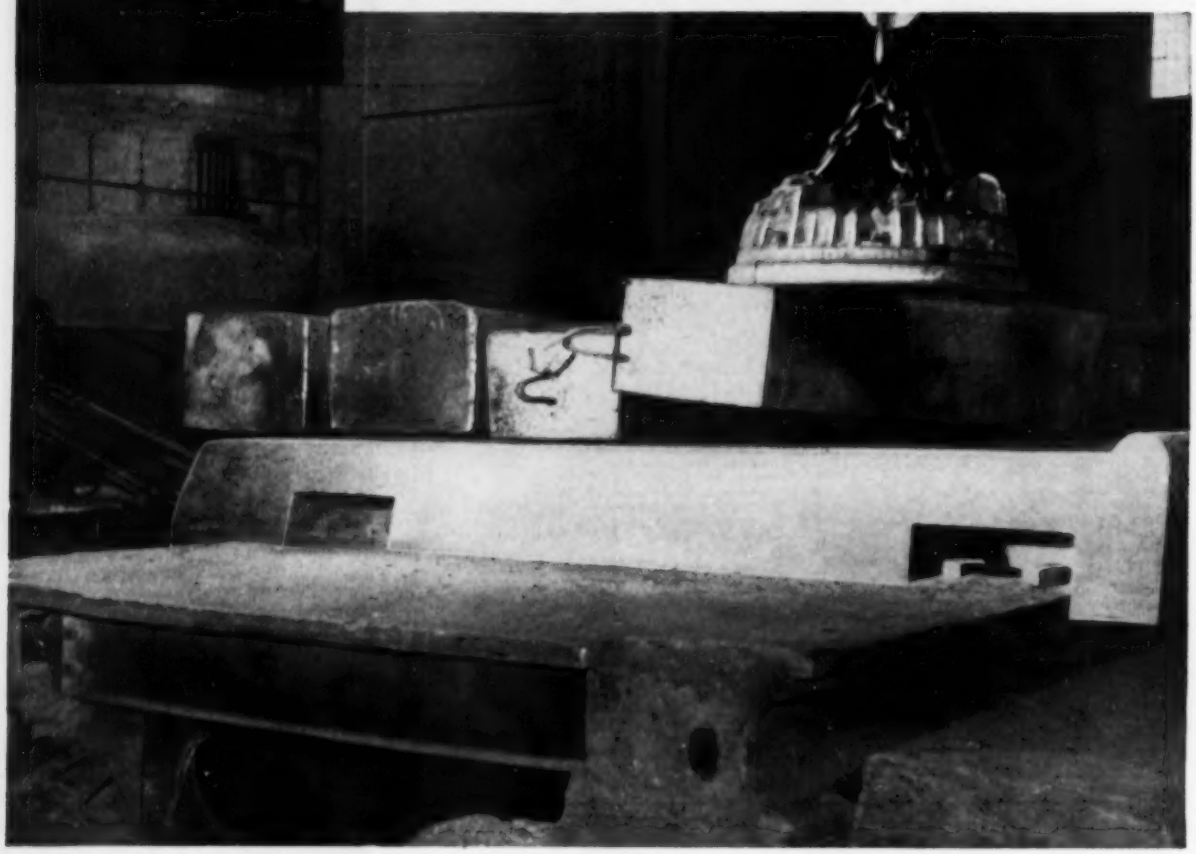


to withstand constant impact of heavy ingots!

Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

A magnet piles heavy ingots onto these rugged BIRDSBORO-built skids for transferring to the inclined chain drag conveyor at left. It's a tough job demanding the heaviest and most rugged design of mechanical equipment.

Wherever tough service conditions exist, you'll find the name BIRDSBORO on all types of dependable, trouble-free mill machinery.

MM-36-54

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

Why the builder of this plate shear installed a Farval system

FARVAL
Studies in Centralized Lubrication
No. 154

ONE tiny bearing starved for lubrication could shut down this giant 1¼″ x 180″ plate shear, towering above the men who built it. The builder avoided this hazard by installing a modern centralized lubrication system—Farval. In fact, Farval is standard on most Stamco equipment.

The experience of builders and users alike shows that machines lubricated by Farval run longer and at higher speeds without fear of lubrication troubles. Bearing life increases. Maintenance costs drop. Farval saves 45 minutes out of every hour required to lubricate by hand, saves up to 75% of lubricant consumed by other methods.

How Farval works

Farval is the Dualine system of centralized lubrication that hydraulically delivers oil or grease, exactly measured, to each individual bearing, as often as desired. No bearings are ever missed, no matter where located.

Machinery builders prefer Farval because the Farval valve is simple and sure, with wide ports engineered to deliver the *exact* amount of lubricant required. Indicators at every bearing show *positive proof* that each valve has functioned.

Farval helps plant efficiency

Farval on any piece of equipment gives you a measurable advantage for the competitive years ahead! Write for free Bulletin 26. The Farval Corporation, 3270 East 80th St., Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION—Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.

In the photo above, you see the 13 men who built this giant *Farvalized* plate shear. Photo courtesy of Stamco Inc.

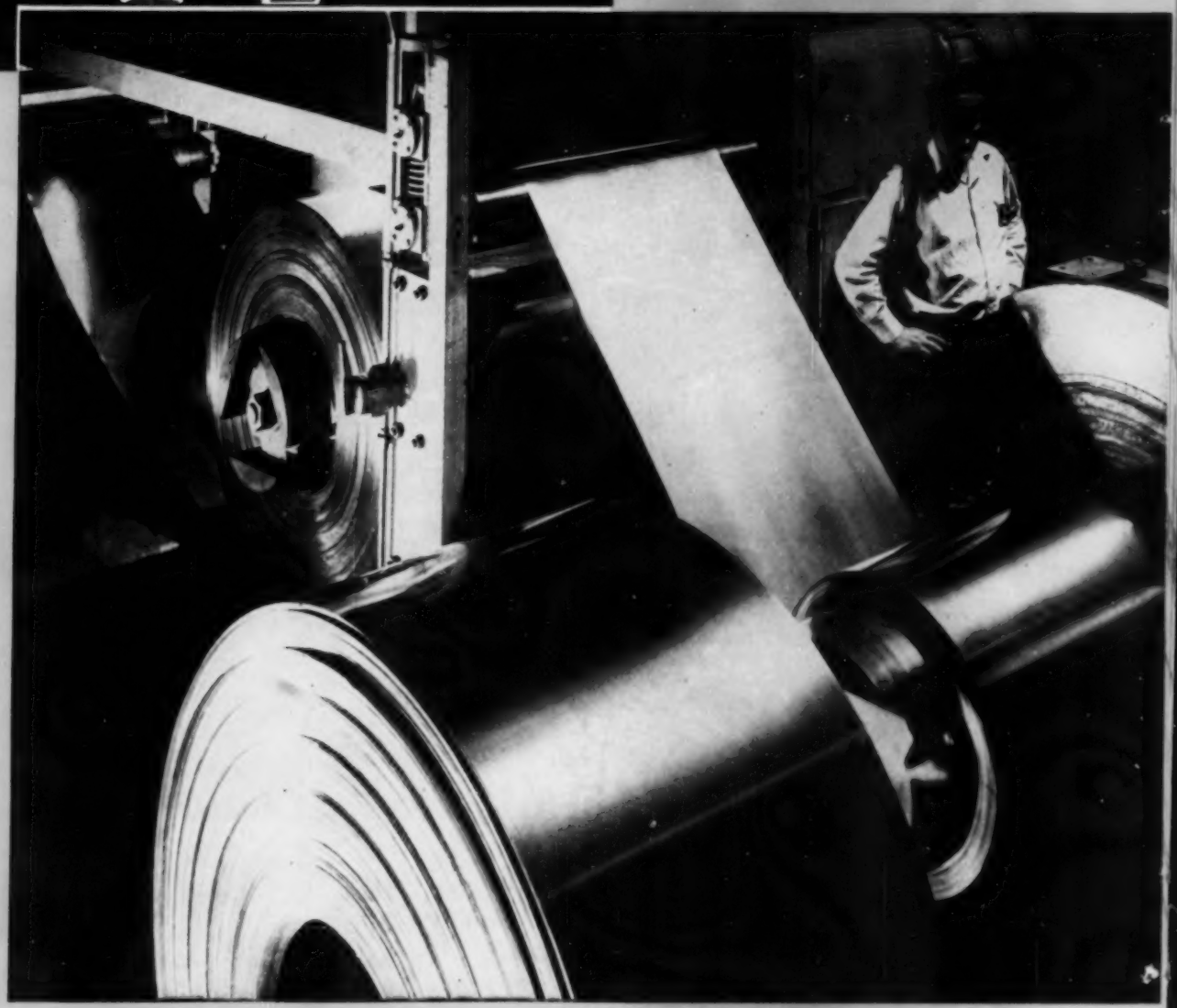
FARVAL
CENTRALIZED SYSTEMS OF LUBRICATION

The WEAN

ENGINEERING

Company, Inc.

WARREN, OHIO



The Wean Engineering Company, Inc., Warren, Ohio is a recognized specialist in the design and installation of sheet, tin and strip mill equipment. The expert knowledge and trained imagination of one of the world's most noted steel mill engineering firms is at your service when you specify Wean—whether the job calls for a single piece of equipment or a complete design of an entire line.

SPECIALISTS IN SHEET, TIN and STRIP MILL EQUIPMENT